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PART I.

Original Contributions.

SUGGESTIONS FOR CLINICAL WORK IN OPHTHALMOLOGY.

By JONATHAN HUTCHINSON.

It is sometimes of great use to point attention to what may be called gaps in our knowledge; to sum up what we have learned, and to shew where it is deficient. I cannot but think that just at present it is especially desirable to do this in respect to ophthalmic matters. We have advanced so rapidly during the last quarter of a century, have acquired so much, and have developed some branches into such wonderful detail, that the mind, contrasting our present possessions with those of the past, easily passes into a state of hope that at length we must have nearly approached completion. This impression is increased by observing the large amount of industry which has been devoted to many matters which in themselves appear to be but of transcendental interest, or of minor importance. If workers find themselves at liberty to elaborate with such painstaking devotion the most trivial departments of our science, surely, it is naturally assumed, our knowledge of all the more important subjects must have been

already placed in the most satisfactory condition. A man does not usually take to blackbird-shooting when there are partridges at hand. Now although there is no kind of stupid folly which I would more earnestly endeavour to avoid than the intentional depreciation of those who work at small subjects, or at matters which to superficial observation seem to lie at a distance from practical results, yet I must ask to be allowed to put in a plea in favour of the habit of "trying back" in the field occasionally, that we make sure that we have not walked past any larger game. It is quite true that in the field of science it is by no means easy to estimate the value of your quarry even when it is in hand, and on this account honour should be given to the worker with regard chiefly to the ability and industry displayed, and with but little reference either to the field selected or the products obtained. Many a discovery which looked pitifully small, or which the practical man regarded with scorn as a matter of dilettanti recreation rather than of real value, has proved subsequently to be the key to a hidden store of wealth. Still, however ready we may be with the laurel for those who have developed our knowledge of physiological optics, of the histology of the structures of the eye, and of its minute pathology, we may be permitted yet to assert that there is much in other departments still to be done. It is partly in consequence of a strong conviction on this point, and partly in answer to many private enquiries from young observers as to what remains for them to do, that I have ventured to write the following paper. I can only hope that I shall not be accused of presumption in doing so. I am well aware that it might have fallen into far abler hands; and am, indeed, not without hope that it may yet be supplemented by others. It would be difficult to suggest to the seniors in our specialty,—those whose lives have been spent in the acquisition of ophthalmic experience,—any more useful task than that they should put down for the benefit of others a statement of the questions which appear to them to need further

elucidation. We are too apt to wait until we think we have definite knowledge to communicate before we take up the pen, for, under many circumstances, our doubts and difficulties, fairly and candidly stated, are of more value, in their suggestiveness to others, than what we think to be our knowledge. It is upon those who have lived long and seen much that duty of this kind should mainly devolve; but not perhaps wholly upon them. I have often thought that it would be well for systematic authors, instead of covering ignorance by vague phrases, as is too often the case, to append to each chapter a list of what to their minds, fresh from the investigation of each subject, appear to be desiderata in respect to it. Clinical observation is a work of such immense width, that unless undertaken on system, and with a guiding thread, it is interminable, and may easily result in fatigue and disappointment rather than in profit. It is in the hope of contributing my small quota towards the object to which I have referred that I venture to publish the following fragments.

GLAUCOMA.

The chief facts respecting the more common forms of glaucoma have been well investigated. There are, however, some of its less frequent types which will repay further work. It is very desirable that all cases should be recorded in which a tendency to *relapse after the performance of a satisfactory iridectomy* occurs. I believe that it is a matter of general experience that if one relapse after iridectomy occurs, little or no benefit will be obtained from a second. These cases are so rare, that it is only by collecting examples from the practice of many ophthalmic surgeons, that satisfactory data for the investigation of their peculiarities can be hoped for. A certain number are already recorded in our ophthalmic journals.

All cases in which glaucoma occurs to *young persons* ought to be recorded, with careful attention to any circum-

stances in the history which might throw light upon the cause of the disease. Cases in which there is no abnormal condition of refraction should be kept in a group to themselves. The younger the patient the greater is the interest of the case. Is glaucoma, when it occurs under the age of 30, ever cured by the performance of iridectomy? Is there any other plan of treatment which influences its course?

In investigating the remote causes of glaucoma, attention should be paid to the *diathesis of the patient*, and especially enquiries made as to any family history of gout or other forms of arthritis. It is desirable also to record the temperament of the patient as denoted by colour of hair and iris. The influence of *neuralgia of the fifth nerve* requires investigation, for it is not at all an infrequent history that our glaucoma patients have, for long previously, been liable to severe toothache, and it is quite possible that in some cases this source of nerve disturbance stands as the true cause of the eye disease. Are cases in which facial neuralgia has preceded glaucoma more liable than others to relapse?

Cases of glaucoma in which indications of deranged function either of the fifth or of other nerves are present deserve attention. I have recently operated on more cases than one in which the patient noted an entire failure of the secreting function of the lachrymal gland. The patients, women, have become quite unable to express emotion by tears, although formerly accustomed to do so easily.

RETINITIS PIGMENTOSA.

Ophthalmic surgeons have it in their power to add most important facts as regards the laws of *hereditary transmission* by the careful investigation of this most singular malady. There can be not the slightest doubt that it is remarkably hereditary, and in all cases the facts, as regards its transmission, should be recorded in the

utmost detail that they can be obtained. Cases which favour the belief that consanguineous marriages may produce a tendency to it are of especial value. In these care should be taken to avoid the fallacy that possibly a consanguineous marriage may only have intensified a previously existing tendency to the disease. All cases in which retinitis pigmentosa appears in a family for the first time, whether with or without the history of a consanguineous marriage, ought to be placed on record, after full enquiry as to all influences which could by possibility have acted as causes. In reference to this class of cases it must be recollected that, in a few instances, inherited syphilis may produce changes exceedingly like those of retinitis pigmentosa, but to be distinguished from the true disease on careful examination.

All cases in which retinitis pigmentosa is *non-symmetrical* possess much clinical interest. As a rule I should consider that any marked tendency to asymmetry was a suspicious fact in the direction of a remotely syphilitic cause. I do not know that I have ever seen a case of hereditary retinitis pigmentosa in which there was much deviation from symmetry.

In all cases of retinitis pigmentosa the presence or absence of symptoms of degeneration in other parts of the nervous system should be sought for: deafness, loss of smell, mental defects, &c.

An ophthalmic surgeon who may chance upon a good example of this rare malady, and may not feel inclined to trouble himself about it further than the limits of his own specialty, is bound in the interests of general medicine to hand it over for investigation to some naturalist of wider sympathies.

DIPHThERITIC OPHTHALMIA.

Whether we apply the term diphtheritic to all forms of conjunctivitis in which a pellicular or croupous coating of lymph is present, or limit it to those in which there is

solid deposit in the submucous cellular tissue, the malady is a very rare one in English practice. My impression is that a large proportion of the best characterised cases are met with in connexion with scarlet fever. It is not enough that the ophthalmic surgeon should satisfy himself as to the best means of treating this disease. Every case in which it is met with should be made the subject of special enquiry as to predisposing causes, as to contagion, state of health of patient, hygienic conditions of residence, &c., and more especially, as just hinted, as to the possibility of the presence of scarlatina poison. So few cases are met with in English practice that a brief record of every case would be no unworthy use of the pages of a journal. It is probable that conclusions would be arrived at of a character likely to be very useful in settling some of the debated questions as to the relationship between croup, diphtheria, &c. I am not aware that in England a diphtheritic type of ophthalmia has ever been observed to become epidemic; only a very few sporadic cases have come under my own notice. I believe that it is not usually attended by any throat symptoms, nor followed by that tendency to peculiar forms of paralysis which is so marked after pharyngeal diphtheria.

PARALYSIS OF ACCOMMODATION.

It is well known that after pharyngeal diphtheria paralysis of accommodation very frequently results. It would be of great interest to determine how far this is due to the blood condition peculiar to diphtheria and how far to the special part primarily attacked. Can other inflammations of the throat, not diphtheritic, produce the same result? I have seen several cases in which accommodation-paralysis followed sore throats which were believed to have had nothing of the diphtheritic character in them. In one the patient had had pharyngeal abscess, and in two or three nothing more than a very slight and transitory

sore throat was admitted. Can inflammations of other parts of the mouth become the causes of this symptom? I have never seen any case in support of the belief that tooth-ache, gum-boil, &c., may produce temporary paralysis of accommodation, but I have been told that this belief is accepted by some German authorities.

CASES OF CONGENITAL CATARACT.

Cases in which cataracts are really congenital, *i.e.*, the patient born with conspicuous opacity of the lens, are not nearly so frequent as has been supposed. Most of the cases which are put vaguely under the head "congenital cataract" are really cases of lamellar cataract in which the opacity develops during the first few years of life. If a new-born infant comes under observation with developed cataract the case should be scrutinized as regards the following points:—

A. Is the opacity lamellar or general?

B. Is there any central speck of the nature of a pyramidal cataract?

C. Does the child display any other defects or peculiarities of development?

D. Is it the offspring of a consanguineous marriage?

E. Is there any history of cataract having occurred in the family before?

F. In later years the course of dentition, both of the first and second sets, should be noted, as also the rate of the child's growth.

G. After removal of the cataract, the fundus of the eye should be examined and its state recorded.

H. In case the operation should, for any reason be deferred, it would be interesting to observe whether any spontaneous tendency to clearing of the opaque lens occurred. I make this last remark because, in the case of a congenital cataract in a rabbit under my own observation, the lens, which at birth was wholly white, became in

the course of a few months transparent everywhere, excepting a little opacity at the posterior pole.

UNSYMMETRICAL CATARACT.

An interesting paper might be written upon the various conditions under which cataract of one eye only is met with, attention being specially given in each instance to the probable cause. Some of these occur in infancy, but more frequently monocular cataract is met with in middle life. Some cases are probably only examples of delayed symmetry; but even in these, if the interval be one of many years, it would be of interest to ascertain, if possible, whether there was anything to explain the precedence taken by one eye. A few other cases of monocular cataract are to be explained by reference to injuries which have been overlooked or forgotten. Excluding all such from the group, it would be of much interest to observe whether the irides usually differ in tint in cases where only one eye becomes the seat of cataract; whether there is marked difference in refraction; and lastly, whether the patient shows any other deviations from symmetry in his head or body.

INFLUENCE OF RACE AND CLIMATE UPON EYE DISEASE.

It is, I think, much to be desired that one or more of the highly-educated and intelligent students who, according to present custom, devote long periods to the study of eye diseases in the several European capitals should attempt something in the way of an estimate of the relative frequency of certain of the maladies which come under their observation. The comparison of the published reports of hospitals might, it is true, give us some data for international contrasts of this kind, but not without great fallacy, on account of want of uniformity in the use of nosological terms. What I should like would be that some observer who had had opportunities of see-

ing large numbers of patients in Berlin, Vienna, Paris, and London should collate such statistics as he could find published, and correct them by the impressions which he had himself formed. Conclusions of considerable interest and value would in all probability be arrived at. The great preponderance of granular inflammations of the conjunctiva and their results, in Ireland and in France would, I think, be clearly brought out. Wider investigation still in the United States and in other parts of Europe would, I believe, make it clear that this is not a matter of habits of life or peculiarity of diet, but that it is due to race. My own observation and the result of enquiry would lead me to believe that in English and Scotch practice a smaller proportion of these cases is to be met with than in any part of the Continent, and that Dublin and Paris might, in reference to its abundance, compete for precedence.

I believe that it would be found that the various forms of arthritic iritis are far less common in the cities of Germany and Austria than in London.

(To be Continued.)

ON A NEW OPERATION FOR DISTICHIASIS, WITH A
SUCCESSFUL CASE.

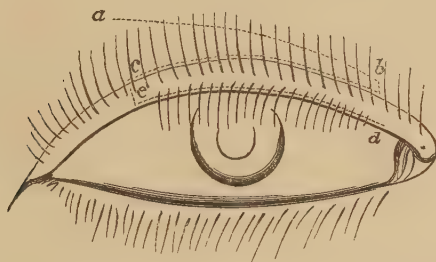
By W. SPENCER WATSON, F.R.C.S.

A YOUNG woman, æt. 22 years, came to the Central London Ophthalmic Hospital, with severe keratitis in the right eye of some years' standing, which on examination was found to be due to the irritation produced by a second row of eyelashes in the upper lid in its middle third. The faulty eyelashes were directed almost directly downwards, and swept the upper half, or two-thirds of the cornea at each movement of the lid. The cornea itself was very rough and nebulous in the greater part of its extent, and the patient had constant photophobia and pain from the presence of the faulty eyelashes.

On October 12, 1871, I performed the following operation, the patient being under the influence of chloroform. A horn spatula being passed under the eyelid, was held by an assistant in such a position as to keep it steady and stretched out horizontally and away from the globe. A horizontal incision was then made in a plane parallel with that of the tarsal cartilage along the middle third of the lid, immediately behind the line of implantation of the eyelashes, the point of the knife being thrust upwards and slightly backwards, to the extent of about 2''' or 3''' from the free border (the same incision being made as if for the purpose of scalping the eyelid, as in the old operation for trichiasis), and carried along till it reached the point *e* in the diagram. A second incision was then made in a plane at right angles to the first, along the skin surface of the lid from *e* to *b*, and the included flap between these incisions dissected off from the subjacent tissues, and the two incisions joined by a vertical incision at *c*. By their means a triangular flap was formed, attached by a broad base at *b d*, and free at *e*, and including both

rows of eyelashes with their bulbs and a strip of cartilage. A second flap was then formed by a third incision from *b*

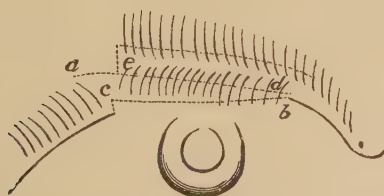
Fig,1.



to *a* in the integument of the lid, and this flap freed by dissection from the subjacent muscle.

The flap, *a b c*, was then turned down into the position of the first flap, and the first flap in turn placed into the position recently occupied by the second. Both flaps were secured in their new positions by interrupted sutures, as shown in the smaller diagram. It is then seen that a

Fig,2.



portion of the tarsal margin at the outer canthus has been left untouched, and between this and the transplanted row of eyelashes there is a bridge of skin of about 3''' in width. It was at first thought that it would be necessary to divide the bridge of skin, in consequence of the interruption in the line of eyelashes which it would cause if left. As, however, the wounds healed in a few days, it was found

that the eyelashes of the transplanted flap fell so completely over the interruption, that the latter was hardly noticed. In a fortnight from the date of the operation the edge of the eyelid had assumed a normal appearance, and all irritation of the eye had ceased.

Remarks.—It is obvious that this operation is equally applicable to many cases of trichiasis, and to cases of distichiasis, in which there is a double row extending from one end of the eyelid to the other, the only modification required in each case being in the length of the flaps. It appears to have a great advantage over the ordinary method of scalping, and is more easy of performance than either v. Graefe's or Arlt's, and is effected without removing any portion of skin.

In the particular case reported, the appearance of the patient was strikingly improved, as the eyelashes in their new position were very long, and came horizontally forward, in a way to cast a very complete shadow over the cornea, at the same time hiding any appearance of cicatrix either above them or below, excepting on a very close scrutiny.

DISTICHIASIS.—PLASTIC OPERATION.

Explanation of the Woodcuts.

The dotted lines indicate the course of the incisions, and the letters in Fig. 1 indicate the same points as the same letters in Fig. 2.

Fig. 1. The lines at *d e* and *c b* form a flap, including the roots of the faulty eyelashes. The lines *c b* and *b a* form a triangular flap of integument in the upper eyelid.

In Fig. 2 these flaps are transposed, the lower flap being in the position lately occupied by the upper one.

A CASE OF SYMPATHETIC OPHTHALMIA IN WHICH
RECOVERY RESULTED.

By HENRY POWER, F.R.C.S.

The satisfactory termination of severe sympathetic ophthalmia is so rare an event that I have thought it advisable to place on record the details of a case of this nature that recently fell under my notice, and which caused me much anxiety for many weeks.

E. H., æt. 19, a rather small, pallid, and delicately-made young man, engaged for six or seven hours a day in an office, was playing with his brother, on the 28th February, 1872, when he received a stab at the inner margin of the cornea of the left eye with a steel pen. A little pain and lachrymation followed, and a small black swelling, as large as the head of a pin, appeared at the point of injury. Little notice was taken of this spot for a fortnight, and it appears to have been regarded as an ink-stain. The eye continuing to be red, the mother at length examined it more carefully, and observing the swelling, brought him to me on the 15th March. He then complained of pain, but not different from that which would be produced by the presence of such a foreign body under the lids. The inner part of the conjunctiva was injected, with one or two large vessels running up to the protruded portion of iris, and there was considerable lachrymation. The pen had penetrated exactly in the horizontal meridian of the eye at the junction of the sclerotic and cornea. The pupil was displaced towards the wound, and the protrusion consisted of the periphery of the iris, the margin still remaining free and moveable under the action of light. The right eye was perfectly healthy, with a bright blue iris, acting freely under the stimulus of light, large pupil, and clear bluish sclerotic.

Not anticipating how serious a case it would prove, I touched the protrusion lightly with a point of nitrate of silver, instilled a drop of atropine solution containing two grains to the ounce, applied a pad and bandage, and directed him to go home and keep himself at rest for a day or two.

On the 19th March he returned to me with the parts in precisely the same condition as on the previous visit, the white precipitate or eschar formed by the nitrate having washed away, and the little tumour being as prominent and as black as before. The same measures were repeated, the point of the nitrate being applied a little longer and rather more firmly.

On the 1st April there was still no change, except that the *right* eye was a little congested and watery, and both the lad and his father becoming impatient about his absence from work for an ailment apparently so trifling, I snipped off the protrusion without any difficulty, with a pair of scissors curved on the flat. Noticing the slight weakness of the right eye, I warned the father that injuries of this kind were occasionally followed by serious results, and ordered for the boy a grain of quinine and three grains of hydrargyrum c. creta, as an alterative and tonic, three times a day.

On the 4th April, sympathetic ophthalmia had become established in the right eye. Both eyes were of a rose-pink tint, the subconjunctival and scleral vessels being specially congested. The pupil of the right eye was contracted, and there was considerable intolerance of light and lachrymation. There was pain, but only moderate, in the eyes, brows, and temple; and I could not find that the sclerotic in the left eye near the injury was particularly sensitive. A leech was ordered to each temple, and he was directed to take the following draught three times a day:—

Sol. strychniæ, $\mathfrak{m}\text{iv}$.
 Tinct. ferri. sesquichlor., $\mathfrak{m}\text{x}$.
 Quiniæ disulph., gr. ii.
 Sp. chloroform, $\mathfrak{m}\text{x}$.
 Aquæ, $\mathfrak{z}\text{i}$. Ft. hst.

On the 8th April, general appearance of eyes unchanged. On close examination, several tags of adhesion were observed between the iris and the capsule of the lens in the right eye. A strong solution of atropine was instilled into each eye.

9th April.—The adhesions have broken down.

10th April.—Has come up to town to be within reach. No pain, both pupils moderately dilated. The angry look of both eyes still persistent, T + 1 of left, T n. of right. He was now

kept in a very dark room, the blinds being drawn down and the shutters closed. To continue the strychnia and iron.

11th April.—Experienced pain on waking, which he attributes to the room being light. Pupil of right eye well dilated, congestion less. No pain at time of visit. No increase of tension in either eye. Left eye examined very carefully with blunt end of pencil, but no specially tender spot could be discovered. Pressure was not complained of till it was considerable in amount. No atropine was instilled.

12th April.—Passed a bad night. Pupils contracted, especially of right eye; complains of pain. There is not much intolerance of light, perhaps not more than any one would experience who had been long sitting in the dark. The examination was usually made by slightly opening the shutter and the light admitted was moderate. It always caused a little lachrymation.

13th April.—A consultation was held to-day with Mr. Critchett, who commented upon the slight disposition to the effusion of lymph that appeared to exist either in the substance or on the surface of the sympathetically affected (right) eye. No change was made in the treatment, except that a leech or two should be occasionally applied. Pupils widely dilated with atropine.

14th April.—Two leeches applied last night; bled freely; thinks he is a little better; pain inconsiderable. Congestion of a pink-rose colour, very marked in both eyes.

15th April.—The vision of the eyes was tested to-day, and it was found that he could read 16 Jäger with either eye, but with neither could he make out a word of 14. Pulse to-day, as it has been throughout the affection, high, ranging from 96 to 106. His temperature had unfortunately not been taken, but there was no reason for considering it to have been high; hands and feet usually warm. No feverishness or thirst complained of. Appetite good. Bowels always regular and motions natural.

16th April.—Two more leeches applied.

17th April.—Had a good night. Pupils well dilated. Left eye decidedly paler. Sees everything much brighter with it than with the right. The strychnia was discontinued for a day or two, and instead I gave him tentatively a quarter of a grain of belladonna in a pill every six hours.

19th April.—Woke in the middle of the night perfectly free from pain; but on waking at six, experienced sharp pain in the

right eye, though the room was quite dark. Pupil of left eye widely dilated; of right, contracted, with a point of adhesion at inner margin of iris, both eyes watery, redness of conjunctiva, and sclerotic of right eye increased, but not of left. It would hence appear that the slightest touch of the iris or ciliary processes with the lens is apt to set up irritation. When he looks down and then suddenly up, he experiences pain and a flash of light in the right eye. No other movement of the eye causes this flash.

20th April.—Belladonna and glycerine rubbed round the eyes. Left sclerotic paler. Can read No. 14 Jäger with left eye, indicating marked improvement. Continue belladonna pills, and add quinine gr. i, and hyd. c. cret. gr. iii to each.

22nd April.—Two leeches applied.

25th April.—Improvement slight but perceptible. General health and spirits good. Injected into the right arm two minims of a solution of acetate of strychnia, containing gr. iii to one ounce of distilled water, or about 1-80th of a grain. The pills were directed to be continued. Returned to the strychnia and iron mixture, which he took almost uninterruptedly from this time forward. No effects from the injection.

26th April.—Five minims of the strychnia solution injected. Is free from pain, and says the vision of right eye is improving, that of left rather duller. I endeavoured to examine the fundus with Carter's small ophthalmoscope and a candle, but could not see the fundus in either eye plainly, partly on account of the indifferent light, partly on account of the intolerance of light and lachrymation, and partly, I thought, because the media were turbid. I sent him out for an hour this morning, with a pair of dark glasses with flaps, and a shade, as he was beginning to be weary of confinement. In the evening he was better for the exercise, and I again endeavoured to examine the eyes with the ophthalmoscope, and with better success. The whole surface of the left lens was found to present punctated opacities, which were especially marked at the lower part. The disc was not clearly visible, but gave me the impression of its margins being obscured by serous effusion, and this was quite borne out by examination of the right eye. The media of this eye were much clearer, but the outline of the disc was entirely lost. The vessels (veins) were large and numerous. The examination was necessarily a

hasty one. Tension of both eyes normal. Sparks occasionally seen. No pain.

27th April.—Injected 7 minims of strychnia solution, morning and evening, and ordered two blisters. In the evening, eyes paler than they had hitherto been. The vision with the left eye was the worst, but he could distinguish the forms of people on the opposite side of the street.

28th April.—Blisters rose well. Has had no pain, no sparks. The capsule of the left eye more opaque, with an infinite number of whitish-grey round spots, not visible by direct or oblique light, but very perceptible under the ophthalmoscope. No outline to the left disc, that of the right rather more defined than before, but still very much blurred. No small arteries visible. Large veins partially obscured for some distance from their points of entrance. Can read No. 10 Jäger with right, and No. 14 with left.

29th April.—Eight minims of the strychnia solution injected in the morning, but some headache following, it was not repeated at night. Colour of the sclerotic of both eyes steadily becoming paler.

2nd May.—The same treatment has been continued, but to-day the breath being slightly tainted with the mercury, its use was discontinued. The iron, strychnia, and quinine were continued.

4th May.—Two leeches last night. Can read No. 8 Jäger with right, and No. 6 with left; both discs much better defined. External appearance of eyes much improved. Redness, lachrymation, and intolerance of light all much diminished.

9th May.—Redness almost gone. With right can read No. 4, with left, No. 6. The margins of both discs still very indistinct, a greyish haze extending for a considerable distance over the retina.

14th May.—Can read No. 1 Jäger with right, and No. 4 with left. The left retinal vessels are almost lost, as they pass across the disc. In the right eye the disc more defined, all the vessels large, tortuous, and exhibiting a distinct curve where they cross the margin of the swollen papilla. Subcutaneous injection of strychnia stopped.

On the 18th of May, when all had been going on well, he had

a relapse, especially affecting the right eye. It was found that he could not read 14 with this eye, but could make out 6 with the left. Right eye much more red, tender, and painful; nevertheless, the disc was certainly not more obscure than before. On the following day, the left was in the same condition as the right. The relapse was clearly due to neglect of the use of atropine, and was immediately relieved by its being recommenced, and by a repetition of the injection of eight minims of strychnia.

21st May.—With the right eye can read No. 14 J. a few minute dots visible with the ophthalmoscope upon the capsule of the lens; media otherwise clear. With left eye No. 6 J. read with difficulty. To apply one leech to each temple.

23rd May.—Has again omitted to instil the atropine, and as a consequence, there is more inflammation of the left eye. It was observed to-day that although much smaller print could be read with the left eye than with the right, yet that the vision of the right eye for distant objects was very superior, a circumstance of which I can offer no explanation. No. 18 Jäger could be read at 8 feet with the right eye, but 20 could not even be dimly seen with the left at that distance.

27th May.—Can read No. 10 J. with right, but only No. 8 with left. No pain since the 24th.

30th May.—All inflammation has steadily subsided since the dilatation of the pupil was effected. With right No. 8 Jäger, with left No. 8" also. Left disc very blurred. Opacities on capsule appear smaller and fewer in number. Right disc better defined, tension natural in both. No strychnia injected.

3rd June.—Right, No. 6 of Jäger, left, 6 Jäger; right 20 Snellen, read at 10'; left, 20 Snellen, read at 3'.

11th June.—Progressing favourably. No. 1 of Jäger read with right, and No. 2 with left. Definition of discs, especially of right, greatly improved. Recommended to go into the country.

5th July.—Since the last visit, has been at Margate, and returns looking remarkably well. The right eye quite natural in appearance, the left a trifle congested. No pain in either eye. Can read No 1 at 6 inches with both the right and the left eye. With the right can read No. 20 of Snellen at 20 feet; with left he can only read this type at 18 inches. On ophthalmoscopic examination, the media of the right eye are found to be perfectly

clear, and there was nothing that I should have noted as peculiar about the disc, except that it was pale. In the left eye there was a triangular group of small spots on the upper part of the capsule of the lens, but the media were otherwise clear. The disc tolerably well defined, but still blurred, especially at apparent lower part, where the vessels were partially obscured.

On the 18th, I saw him for the last time. He could then read No. 1 with both eyes. The eyes looked perfectly healthy, except for the displacement of the left pupil. He drops in atropine once a week.

I attribute the successful issue of this case to the pupil being kept widely dilated from an early period, and to the free use of powerful tonics during the more active period of the disease. Whenever the atropine was intentionally or accidentally omitted, even for a day, so that the iris played over the capsule of the lens, an exacerbation of all the symptoms was sure to occur, a tag of adhesion was formed, pain was experienced, and the redness and watering of the eyes augmented. This was noticed over and over again. If the lymph of which such tags of adhesion be really composed of white corpuscles, we might imagine the course of events to be that owing to paralysis (reflex) of the vasomotor nerves of the vessels of the iris of the sympathetically affected eye, these are congested and dilated, and in fact in the same state as those of the conjunctiva and sclera. So long as the pupil is widely dilated, they are rendered tortuous, and a certain amount of pressure is exerted upon them, but when the pupil contracts, these vessels become straight, and their delicate walls rub against the capsule of the lens, the friction causing or facilitating the escape of the white corpuscles, which constitute the adhesion, and thus the play of the iris is interfered with at one point. The nerves are here consequently dragged upon, pain with the reflex manifestations of intolerance of light, increased lachrymation and redness of all the vessels supplying the eye are induced, which again leads to fresh exudation, and thus the disease has a tendency to perpetuate itself.

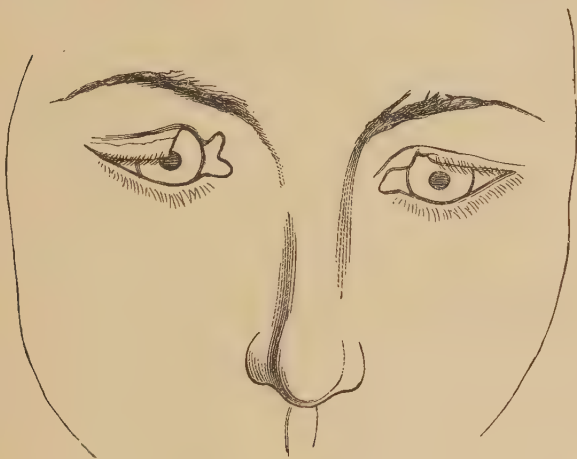
The beneficial action of tonics, such as iron, strychnia, and quinine, is readily explicable on this view: the first constringing the walls of the smaller arteries, and thus diminishing the supply of blood to the part; the second strengthening and giving tone to the nervous system, while the third, as Birz and others have shown, materially influences the activity of movement and the escape of the white corpuscles of the blood. I must acknowledge that my patient was a favourable lad to treat, being of very quiet and unexcitable disposition, extremely steady in his habits, and most obedient in following out the directions given to him.

CASES OF CONGENITAL PECULIARITIES IN THE EYELIDS, &c.

By J. F. STREATFEILD.

I.—*Case of Congenital Fissure (Coloboma Palpebræ) of both Upper Eyelids.*

THE illustration showing the appearance of this very uncommon case is taken from a sketch I made many years ago of one of the out-patients of Moorfields Hospital. It was made before I had any official connection with the hospital, when I was a student there, that is to say, when I was beginning to learn ophthalmology, but it will be seen,



from the very ostensible nature of the case, together with the negative points of the history then obtained, that it required no very special training in order to its right diagnosis. Besides this, it was the opinion of the surgeon in whose practice it occurred, and of all who were present at the time, that the case was, unmistakably, of the nature of coloboma. I made a drawing of the patient, and (I had more time then at my disposal than I now have) not only of the eyes and eyelids, but of her

whole face and head, and (it was very like her) thus I have a better recollection of the case, and I seem to see the patient as if she now stood before me, though my sketch has been forgotten for so long a time since it was made in an old portfolio, and I have no written memoranda in my old note-books that I can lay my hands upon. The patient was a woman of about thirty years of age. She came to the hospital for some unimportant affection of vision not concerning the external parts of the eyes or the eyelids. She had not then, nor was there any history of, any kind of ophthalmia—no past or present inflammation of the eyes—no redness or irritation or discharge of the eyelids, conjunctiva, or cornea, &c., such as might perhaps be expected from the exposed state of the eyeballs. Great clefts, symmetrically placed on the right and left side, existed in the upper eyelids towards the inner side of the lid in each of them; the right fissure was double, as some “hare-lips” are double. The clefts extended quite through all the structures of the lid, so that the ocular conjunctiva was bared to the extent of the fissures in the upper lids. There was no history of any injury or any appearance of cicatrization about the margins of the clefts or extending upwards above them, as if they had been lacerations imperfectly healed, the raw edges not having been properly brought together. The margins of the clefts were quite supple and not at all thickened. There was no appearance as if the eyeballs had suffered from exposure, and she complained of nothing of the kind. It seemed that the orbicularis palpebrarum—as it surrounds the lids, but is anatomically attached internally to bone—had power in this case whenever it was in action, and the lids were closed, to approximate to a great extent, if not to close, the open clefts. And then again it must be noted that these fissures were not in front of the corneæ, which were as completely protected, under ordinary circumstances, by the eyelids, as in the normal condition. I have no recollection of the state of the upper puncta, but

their condition seems to be always very unimportant so long as the lower puncta are in their normal state. Eyelashes only grew from those parts of the free margins of the upper lids which would have formed a part of its proper outline in the normal condition. The patient, in the sketch, is looking a little downwards, so as to show the whole extent of the three clefts more perfectly. She had no hare-lip, cleft palate, nor, I believe, any other congenital malformation. She cared nothing for the appearances of the clefts, which indeed were not very conspicuous deformities, and no cosmetic operation was done or even proposed to her. As to other cases of coloboma palpebræ, I have never myself seen but one, and this but recently, in the practice of one of my colleagues at Moorfields. Wilde ("On the Malformations and Congenital Diseases of the Organs of Sight," 1862, p. 20) says, "it has only been observed in one eye at a time." It does not appear that any case had occurred in his practice. Nor in that of Wecker ("Maladies des Yeux," 1867, vol. I, p. 742), who refers to seven authentic cases previously published by various authors, in one of which a coloboma existed in the lower, as well as in the upper lid.

II.—*Abnormal Pendulous Folds of the Conjunctiva.*

M. Wecker, in this chapter on the "Congenital Anomalies" of the lids, refers, by the way, to two recorded cases of "supplementary lid," and this inclines me to record the fact, that I have lately had a case which resembled those so called by him, and I have certainly seen other similar cases. I have always called them abnormal pendulous folds of the conjunctiva, which, in all the cases I have seen, have been at the *upper and outer* part of the eye, and more or less visible below the margin of the upper lid. In the last case the patient was a boy of 10 or 12 years of age, who came with his mother to Moorfields in some alarm, saying that something was growing over his eye. She told him to look downwards, and showed me

the conjunctival fold projecting a little beneath the upper lid of the right eye and at the upper and outer part of the eyeball. I suppose they had just discovered it. It appeared externally just like the rest of the conjunctiva, which was healthy, but the fold was evidently much thicker than a mere doubling of conjunctiva alone would have made it. It never reached quite to the margin of the cornea; his vision was no way affected; and it did not interfere in any way in the movements of the eye. It could hardly be said to be a deformity, but in most of the positions of the eyeball it could be seen, and I therefore offered to remove it, and as the boy and his mother both wished it done, I did the little operation at once. The patient being under the influence of bichloride of methylene, I seized the abnormal fold at the middle with toothed forceps, and using scissors curved on the flat, the two blades passed one external and the other internal to it; it was easily removed in two cuts, first one from above and then another from below it, joining the first behind the point at which it was held by the forceps. In this way the trifling deformity and cause of their anxiety has been quite removed.

A REPORT ON THE FORMS OF EYE-DISEASE WHICH OCCUR
IN CONNEXION WITH RHEUMATISM AND GOUT.

By JONATHAN HUTCHINSON.

(Continued from page 332.)

CASE XVIII.—*Double Iritis—Rheumatic Pains—Family and Hereditary History of Rheumatic Fever.*

Mr. P., æt. 30, of dark complexion, was sent to me from Montreal, on account of old iritis and opacities in the vitreous; the iritis had begun with muscæ in November, 1869. There was no history of either syphilis or gonorrhœa.

This patient was somewhat liable to rheumatic pains. He stated that whenever he got his knees wet he invariably had a bad cold, but not any special rheumatic attack. One of his brothers had died of rheumatism affecting the heart; his mother and several of her relatives had suffered for some time from chronic rheumatism, and an uncle had had rheumatic gout. On examination I found that he had posterior synechiæ in each eye, and floating bodies in the vitreous of the left. Vision was perfect in the right eye; with the left he could see $\frac{20}{20}$ and 3 J. with difficulty.

Mr. P. remained under my observation on and off for three years. He had several slight relapses of iritis always from exposure to cold. I feel certain that he is not the subject of syphilis and that his iritis is of the arthritic type. It is important to note that the vitreous suffered, and that in fact muscæ were the first symptom.

CASE XIX.—*Repeated Attacks of Iritis in each Eye—Rheumatic Pains in small Joints—Facial Neuralgia—Hereditary History of Rheumatism.*

Miss Norville, æt. 47, consulted me on November 11, 1869, for iritis of the right eye. On examination I found general dimness of the cornea, a small and indistinct pupil (but no nodules

of lymph on the iris), and some ciliary congestion, with enlargement of the emerging vessels; vision was so much impaired that she could not see letters of 100 at 12 inches. The tension of the eyeball was doubtfully increased.

She stated that the dimness had been coming on gradually for about five weeks, but that the congestion and pain had appeared only about a week before; the pain was sometimes very severe. She used atropine freely and for many days under my direction, but the pupil would not dilate in the least. Her vision afterwards gradually improved, until she could see $\frac{20}{60}$.

The above was her third attack of inflammation in the eyes; the two previous attacks were in the left eye; the first occurred six years before I saw her, and she then had iridectomy performed by Mr. Streatfeild (whether for glaucoma or for adhesions did not seem quite clear). In May, 1869, she had her second attack, a relapse in the left eye. She consulted Mr. Critchett towards the end of the attack, which lasted six weeks.

Since she first consulted me I have seen her again (February 11, 1870), for a relapse of inflammation in the eye; it began twelve days before. The lids were much inflamed and excoriated; the cornea was steamy, but there was no marked increase of tension; this attack was not attended by much pain.

This patient has had rheumatic pain in some joints, especially those of the fingers, but this symptom had never been very severe; she had also been liable to neuralgia in the face and forehead. She had never had sciatica or lumbago. She had not been very liable to sick headaches. Her father was "a martyr to rheumatism."

In her eyelids, surrounding the eyes, but not specially in the xanthelasmic positions, there were a number of small flat patches.

CASE XX.—*Repeated Attacks of Iritis in each Eye—No History of Rheumatism.*

Mrs. Mann, æt. 64, consulted me on March 10, 1868, on account of recurrent iritis in her right eye; it was rather a severe attack, the pupil being nearly excluded, and dilating imperfectly with atropine, and vision being very much impaired. The inflammation yielded quickly to blisters, atropine, and iodine. She had had a similar severe attack in the same eye three years before,

and the left eye was slightly inflamed at the same time; between that time and the date of her second severe attack she had suffered two or three slight attacks of inflammation in the eyes. She never considered herself rheumatic.

CASE XXI.—*Double Iritis—Repeated Attacks—No Rheumatism.*

Mrs. Jolly, æt. 55, a healthy widow, came under my care, first in May and June, 1866, for double iritis, affecting the left most severely. I treated her with mercury (to salivation), blisters, and atropine. She thought the atropine irritated the eyes. I also did an iridectomy in the right eye. After a considerable time the inflammation subsided, but it left a closed pupil on the left side; with the right eye she could see to read the newspaper. She remained in good health and free from inflammation of the eyes until May, 1867 (exactly a year from the date of her first attack), when she suffered a severe relapse of iritis in the right eye.

She assured me that she had never had rheumatism, with the exception of occasional pain in the right knee.

CASE XXII.—*Repeated Attacks of Double Iritis—One Eye Lost from Iritis—Liability to Lumbago of a Severe Character.*

John Fish, æt. 64, a healthy country labourer, was admitted on May 21, 1868, under Mr. Hutchinson's care, at the Royal London Ophthalmic Hospital, for iritis in the left eye. The left pupil was partly occupied by lymph; the iris was adherent at the lower part, and there were numerous fine lines of false membrane crossing the pupil; the pupil dilated fairly with atropine. The patient stated that he had had repeated attacks of iritis during the previous six years. His right eye had suffered more than his left, and was quite blind, with a flattened and opaque cornea. He had been very liable to lumbago, and had on several occasions been in bed for a fortnight with it; he had had an attack only a fortnight before his admission.

CASE XXIII.—*Iritis in One Eye—History of Rheumatism in several Joints.*

Alexander Corbett, æt. 39, a pale, broad-cheeked man, was admitted under Mr. Hutchinson's care, at the Royal London

Ophthalmic Hospital, on November 8, 1869. He was suffering from his first attack of iritis. The right eye was affected, and the attack had begun a week before his admission; the conjunctiva was congested, and of a brick-red colour, a fine white ring being left just where the conjunctiva joined the cornea; the pupil dilated very irregularly under atropine; the fundus could be seen dimly, but no disease was made out. The left eye was unaffected. During the two preceding months he had twice had attacks of rheumatism, consisting of pain in the neck, shoulders, right elbow, and right wrist, and in the calf of the left leg; the joints had not swelled. He had never had rheumatic fever. He had had gonorrhœa twice, and chancres 15 years ago, but neither rheumatism nor secondary syphilitic symptoms of any kind followed. Twelve years before admission he had inflammation of the eyes, but from his description it was probably only catarrhal ophthalmia.

CASE XXIV.—*Recurring Iritis in a Patient subject to severe Rheumatic Gout.*

Richard Clark, æt. 48, was admitted under the care of Mr. Hutchinson, on June 6, 1870, at the Royal London Ophthalmic Hospital, for iritis of the left eye. The eye had been inflamed ten days, when he applied; the conjunctiva was much congested and swollen, the cornea hazy and vascular at its margin, with a narrow white line of slightly swollen conjunctiva surrounding it; the pupil dilated very imperfectly under atropine, and seemed to be tied down almost all round. There had been considerable pain in the eye at first, but this had subsided. In three weeks he was well, only a single iritic adhesion remaining; the treatment consisted in blistering, atropine, and the administration of colchicum and iodide of potassium.

This was his second attack; he had been under Mr. Critchett's care for "rheumatic ophthalmia" five years before. He had had three attacks of what he called rheumatic gout, the first of which occurred when he was only eight years old. He had been laid up for five months with a severe attack of the same disease before his first attack of "rheumatic ophthalmia." In these attacks of arthritis the large joints only had been affected.

CASE XXV.—*Recurrent Iritis in a Woman; both Eyes Lost—
History of Rheumatic Fever.*

Mrs. Sweetman, æt. 49, living formerly at Greenwich, afterwards at Grimsby, in Lincolnshire, was in the first instance under Mr. Dixon's care, at the Royal London Ophthalmic Hospital, for double iritis; this was in January, 1867. In June of the same year Mr. Dixon did iridectomy (for artificial pupil) in each eye, and the right eye was somewhat improved. She continued to attend, and towards the end of 1868 came under the care of Mr. Hutchinson, by whom a second iridectomy was made in the right eye in January, 1869. The operation was followed by iritis, and the pupil closed. In April, the other eye (the left) became inflamed and painful, and she was advised to submit to excision; she deferred the operation till September. The remaining eye (the right) was at that time quite blind from occlusion of the pupil. In June, 1870, she again applied on account of pain in the right eye; the eyeball was considerably congested, and very tender on pressure.

In 1865, about two years before her first attack of iritis, she had a severe attack of rheumatic fever. She was ill for many months, and her joints were swollen and painful; her medical attendant considered that her heart was affected. She did not know of any family history of rheumatism or gout. Her attack of rheumatic fever was preceded for several months by indefinite pains and shivering, and by yellowness of skin. She asserted that her doctor told her it was "dumb ague." She was living in an aguish part of Greenwich at the time. She took quinine without benefit to these symptoms. There was no history of syphilis.

CASE XXVI.—*Recurring Iritis in One Eye, in a Woman suffering
from Tertiary Syphilis.*

Elizabeth Wisker, aged 35, married, and the mother of four children, was admitted under Mr. Hutchinson's care, at the Royal London Ophthalmic Hospital, on July 7, 1870, suffering from iritis in the right eye. There was much congestion of the sclerotic, especially in the ciliary region, the aqueous was slightly muddy, and the pupil dilated irregularly under atropine; the eyeball was very tender when pressed. The attack had begun six days before,

and she had had great pain in the eye. She stated that she had had a similar attack a month before, but that it was slight, and passed off in three or four days. For eight years she had been liable to pains, which she described as "rheumatic," in the right arm and in both knees. There could be no doubt that she was also the subject of tertiary syphilis, for there was a large osseous node on her right humerus at the time of admission, and the scar of a "lump," which had broken and healed over the right patella. Ten years before admission she had a still-born child, and it seemed possible that her syphilis dated from that time. Her iritis improved rapidly, and the synechia disappeared under blisters, atropine, and the internal use of iodide of potassium and colchicum.

CASE XXVII.—*Iritis—Cataracts—Preliminary Iridectomy, followed by severe Iritis—Rheumatic Pains—History of Rheumatic Fever in a Daughter—Possible Syphilitic Complication.*

Mrs. Gorsuch, æt. 62, was first under Mr. Hutchinson's care, at the Royal London Ophthalmic Hospital, in 1868, when she was told that she had commencing cataracts; her sight had then been failing for more than thirty years, and she dated the beginning of her failure from a confinement. Two years later, September, 1870, she again came under my care. It was found on examination that she had evidence of past iritis in the existence of adhesions between the iris and lens capsule. The cataracts being complete, on September 15, 1870, she underwent double iridectomy preliminary to extraction. The operation was followed by severe iritis in each eye, obliging her to remain in hospital for three weeks.

She believed herself to be free from any tendency to rheumatism, but stated that of late she had had slight pain in her knees. Her eldest daughter had had an attack of rheumatic fever. No decisive history of syphilis could be obtained, but her former medical attendant considered that she had suffered from it twenty years before, when he attended her. She had had six miscarriages and fourteen living children; six of the latter had died, several of them under two years of age, but none under six months. The only suspicious symptoms in the children had been thrush, and this had occurred only in one or two of them.

CASE XXVIII.—*Double Iritis—Rheumatism—Hereditary History of Chronic Rheumatic Arthritis for two generations.*

John Watkins, æt. 42, a healthy-looking man, of stout build, with florid complexion and reddish hair, was admitted under the care of Mr. Hutchinson, at the Royal London Ophthalmic Hospital, on December 8, 1870. He came to know whether anything could be done to improve his sight, which had been much impaired by a severe attack of double iritis several years before. In each eye there were numerous old adhesions, which prevented the pupil from dilating more than very imperfectly with atropine. The iritis had occurred five years before, and he was then under Mr. Critchett's care; the eyes were inflamed for six months, the disease beginning a few days sooner in the right than in the left. The attack began in the month of March, when easterly winds were prevalent.

He denied all history of syphilis; was married, and had healthy children. He had no rheumatism during his attack of iritis, but ten years before that he suffered from what he called "rheumatic fever;" the attack was probably mild for it lasted only two weeks, and he was not aware that the painful joints were swollen; the rheumatism attacked his right side first. He stated that his mother had for some time been liable to rheumatism; the only part affected was her right hand, which was somewhat crippled and deformed from the disease. His maternal grandmother was laid up for twenty years by severe "chronic rheumatism, and was quite crippled by it."

CASE XXIX.—*Rheumatic Conjunctivitis Persistent for four Months in an elderly Lady, the subject of Chronic Rheumatism.*

Mrs. Handcock is a lady, æt. 60, who was sent to me by Dr. Cowan, of Bath, on account of intractable irritability of the eyes. It affected both eyes equally, and had lasted in spite of all sorts of treatment for about four months, and was somewhat paroxysmal. It had never risen to any high degree of severity, but had often been sufficient to prevent her making any use of the eyes. During the attacks the conjunctiva became much congested. At the time this affection commenced, Mrs. H. was

staying at Buxton with her sister, for the benefit of chronic rheumatic arthritis, from which both of them suffered. Their mother had also been subject to the same disease. There was no history of true gout in the family. The disease seemed of the same nature as that of Mr. Scott (to be detailed subsequently), although less severe, and less definitely paroxysmal. Mrs. H.'s rheumatism, although definite, is not very severe.

CASE XXX.—*Recurrent Iritis—Three attacks within a year always affecting the same eye—No rheumatism.*

Mr. B. was brought to me by Dr. Bright, of Sydenham, in April, 1868, suffering from well-marked but not very severe iritis of the left eye. This was his third attack; the first was in May 1867, the second in August of the same year. In each case the left eye was the one affected. He was married, florid, and of sanguine temperament. He had never had gonorrhœa at any time, nor had he suffered from rheumatism. There was no apparent cause for the attacks of iritis. After his previous attacks, he had always completely recovered, and usually rather suddenly. In the two previous attacks, Dr. Bright treated him by iodides and counter-irritants, and when the disease was subsiding, sent him to the sea-side, which last measure seemed to benefit him greatly.

CASE XXXI.—*Relapsing Rheumatic Iritis—Second Attack—History of Acute Rheumatism.*

Mr. G., æt. 34, a florid strong man, of sanguine temperament and red hair. In April, 1868, he came under my care for his second attack of rheumatic iritis; it was not a very severe one. Two years before, he was under me for his first attack of iritis in one eye; this was in the early spring months. It lasted about three weeks, and from that time to the date of his second attack, he had been quite well. This first attack was a very severe one, and for a fortnight he could see nothing. In boyhood he had rheumatism, and was laid up nearly a whole winter, since then he has had rheumatic pains in the feet repeatedly. He does not consider himself at present specially rheumatic, and on the whole has excellent health.

CASE XXXII.—*Rheumatic Iritis, with slight Articular Rheumatism and Sciatica.*

John Gothard, æt. 55, an engine-man, and much exposed to draughts, came to me in April, 1868, with slight iritis of the right eye, which had been present one week. He had, at the same time, pain in the right hip. He was under Mr. McMurdo thirty-five years ago with iritis of the same eye, and had at that time rheumatic "pains in the joints of his fingers and of his limbs." He has never been laid up with rheumatism, but the joints of his fingers are enlarged, and he appears to have had several slight attacks of sciatica. He is a florid, healthy-looking man. His father was not rheumatic, but was subject to a "severe scorbutic eruption." The facts of this case suggest that possibly the first attack may have followed gonorrhœa, but I have no note respecting it.

CASE XXXIII.—*Relapsing Iritis—Iridectomy in each at different times—History of Lumbago and Arthritis.*

Mrs. Holding, æt. 39. Has had repeated attacks of iritis in each eye. She attended at Moorfields in 1858, when Mr. Hulke did iridectomy in the right eye. In 1863 (November 19), Mr. Hutchinson performed the same operation on the left eye. She again attended in March 1868, with a fresh attack of iritis, and in February of the present year (1869) she came again, complaining of pain over the eyes, but with no definite iritis. She had an attack of lumbago five years ago, and has had rheumatic pains in some of the joints; on one occasion the right elbow was fixed for a time.

CASE XXXIV.—*Repeated Attacks of Iritis in a man subject to Rheumatic Gout.*

Wm. Greenstreet, æt. 41. Three years ago he had an attack of rheumatic gout, and was three months with it in St. Bartholomew's Hospital; at that time he had no inflammation of the eye, but four years before he had "a blight in the eye and a bad inflammation."

He came to Moorfields under my care, on April 2, with iritis of the right eye, a mild attack. He still suffers occasionally from

rheumatism. No history of syphilis; in early life he had a mild gonorrhœa, but nothing more. I ordered iodide of potassium, blisters, and belladonna fomentation.

A week later, the pupil was widely dilated and the congestion much diminished.

CASE XXXV.—*Repeated Attacks of Iritis in a gentleman, the subject of Lumbago and Rheumatic Gout.*

Mr. H., a gentleman well-known on the turf, a free-liver, liable to lumbago, suffered repeated attacks of rheumatic sclero-iritis. They now lasted more than two or three weeks, and appeared to be relieved by iodide of potassium and colchicum. He finally died of disease of the kidneys, attended by albuminuria (? gouty). He was under the care of Dr. Fowler, of Bishopsgate-street.

CASE XXXVI.—*Repeated attacks of Sclero-Iritis, occurring generally in autumn—Liability to Sciatica on one side only—First attack of Eye—Disease symmetrical and following a severe Febrile illness—Subsequent attacks unilateral.*

Mr. Jones, a dispensing chemist, had a severe illness in 1865, which was supposed to be typhoid fever. When he had quite recovered, both eyes suffered from slight sclero-iritis. For the latter he was under my care, and got quite well with iodide of potassium and Chian turpentine. He had been liable before this to severe attacks of sciatica.

In 1868 (October 21), he again came under care with the right eye inflamed. There was great congestion of sclerotic and conjunctiva (brick-red colour), considerable pain, but no great intolerance. The pupil acted somewhat, but was adherent at lower margin. The iris was very slightly discoloured. Mr. J. is a florid, robust man, accustomed to live well, and enjoying usually vigorous health. He has never suffered from rheumatism in any other form, but he has had repeated attacks of sciatica, always in the right side. His father and grandfather are both living, and neither is rheumatic.

Mr. J. tells me that for the last four years he has always in October had one or other of his eyes attacked, but several of the

attacks have been so slight that he did not consult me, but cured them by a few doses of iodide of potassium.

CASE XXXVII.—*Acute Rheumatism with Double Iritis—Severe Relapse of both Affections—Iritis again after fourteen years of health.*

Patrick McCarthy, æt. 59, admitted in 1860 at Moorfields. Twenty-five years before he had had his first attack of iritis whilst in Guy's Hospital, suffering from general rheumatism. His eyes got quite well, but afterwards any attack of cold would cause them to inflame again. He was subsequently for twelve months in St. Thomas's and Guy's Hospitals for rheumatism and iritis; then the liability to both left him, and for fourteen years his eyes never suffered; at length, however, his left eye was again attacked, for which he now came under care. Both pupils were excluded, but dilated somewhat with atropine, and he could see fairly with each eye.

This man had, many years ago, suffered a severe attack of constitutional syphilis; he was treated by mercury to salivation, and after the disappearance of the secondary symptoms, he had never been reminded of the malady.

CASE XXXVIII.—*History of Chronic Rheumatism and of Rheumatic Fever—Single Attack of Iritis.*

William Runciman, æt. 36, a sea-captain, admitted at the Ophthalmic Hospital, 1860, for a first attack of iritis in his left eye. He had never had constitutional syphilis, but there was a history of chancre and bubo fifteen years ago. For ten years he had been liable to repeated attacks of rheumatism, which had commenced in the first instance in consequence of exposure to extreme cold after shipwreck. Once he was laid up for a month with rheumatic fever, but his chronic pains appear to have been chiefly muscular.

CASE XXXIX.—*Repeated Attacks of Iritis in One Eye only, without much damage to the Sight—Annual Attacks of Gout for Seventeen Years.*

John Thomson, æt. 63, a publican. At the age of 45, he had

his first attack of gout, and has had it once a year ever since. He is not aware that it is hereditary. The right eye only has suffered from iritis; its pupil is irregular. He has had attacks more or less severe every spring for many years. He had a doubtful attack of constitutional syphilis thirty years ago.

CASE XL.—*Twelve Attacks of Iritis during Twenty Years, with persistent liability to Sub-acute Rheumatism.*

John Meriton, æt. 58, has both his pupils excluded by the effects of iritis. His first attack occurred twenty years before his admission at Moorfields, and it lasted nearly two months. Since that he has had a dozen others; they usually occur in the autumn, and are accompanied by great pain, affecting sometimes the right eye, sometimes the left, and occasionally both at the same time. He was under Mr. McMurdo's care in 1852 with the diagnosis of "corneo-iritis," when he attended one month; in 1858 he was under my own care with the diagnosis "acute iritis of the left eye, with slight hypopyon," when he attended three weeks. (These particulars are copied from old letters.) In spite of these repeated attacks, he still retains tolerable sight. The treatment has usually been by iodide of potassium and blisters.

For twenty years he has been liable to frequent attacks of sub-acute rheumatism, never severe enough to confine him to bed. He has had chancres several times, and has repeatedly taken mercury, but there is no evidence of his being the subject of constitutional syphilis.

CASE XLI.—*"Rheumatic Fever," followed shortly by Iritis, first of one Eye, then of the other.*

Henry Dowden, a tall, thin man, æt. 23, came first on May 17, 1869, with iritis of the right eye. The eye had been inflamed for a month. The left eye had been slightly inflamed at first. The *right* pupil was adherent everywhere, but of fair size. With atropine it did not dilate at all, nor did it become irregular. The iris was greenish and discoloured; there were no nodules of lymph, but ciliary congestion was present. It was already somewhat better, for he had "been blind for three weeks." About three months previously he had rheumatic fever; he was in bed

two weeks, confined to the house six weeks; he had been about again three weeks when I saw him.

He never had lumbago or sciatica, and this was his first attack of rheumatism. He was never ill before. Two years before I saw him, he had gonorrhœa, but no rheumatism after it, and there was no urethral affection when he came under observation at above date. No reason to suspect syphilis.

CASE XLII.—*Repeated Attacks of Gout or Rheumatic Arthritis (?), beginning at 40—Acute Iritis of one Eye, coming on directly after recovery from a Gouty Attack in a corresponding great Toe—Patient a free Wine Drinker—Gout in two Brothers, and in his Mother's relatives.*

Mr. K., æt. 45, is a traveller; he is thin, of dark complexion, and becoming grey. I treated him in August, 1872, for acute iritis of the right eye of ten days' duration. He had been suffering for about two months previously from gout in his right great toe. The eye inflamed two or three days after the toe had got well. He was at the sea-side when the eye inflamed, and the weather had suddenly changed to wet and windy.

He has been subject to rheumatism or gout (?) for four years. The first attack was in his legs; since then he has had it about four times, and usually in several different joints at once. It has never been quite bad enough to lay him up. There are decided lips on the condyles of his femurs. He knows that "rheumatic gout" is in his mother's family. He has two brothers, and both of them have had gout slightly. He himself is in the habit of always drinking half a pint of wine daily, and this although he finds that he is much better without it. Formerly he drank port chiefly, but of late chiefly sherry and claret; he drinks stout also. He states that his urine hardly ever gets thick.

CASE XLIII.—*Iritis, insidious and persistent, attacking first one eye and then, after several years' interval, the other—Vitreous opacities—History of Gout in relations.**

Mr. W., æt. 17, a clerk, rather stout, of fair complexion, was

* The following case has already been published in a clinical lecture on a peculiar form of iritis met with in the children of gouty parents. (See *Lancet*, January, 1873.)

sent to me by Dr. Ramskill, in May, 1870. He has gray irides. He is myopic $\frac{1}{16}$ in the left eye. He came to me for dimness of the *right*, which I found to depend on a striated floating opacity in the vitreous. I noticed also that the pupil did not act well, and that the iris was not of so bright a colour as the left. There was no history of injury.

In January, 1872, he again came complaining that the *left* pupil was not round, and that he had lately had occasional slight pain in the eyes, sometimes in one, sometimes the other. It had been worse in the left, but had never been enough to lay him up. I could find no positive adhesion in the left; the iris was active, though the pupil was not quite round.

I did him an iridectomy upwards in the right. A rim of pigment and new material remained behind on the capsule of the lens, and the whole pupil was found to be covered by thin membrane. The eye remained quiet after the operation. About two months later he noticed specks before the *left* eye, and some aching in it. I could find no opacities in the vitreous. The iritic adhesion had increased slightly. He could still read 1 J. with this eye, however, whilst with the right (operated) eye he could only see the largest letters. The iritis in the *left*, however, still advanced, and presently large thin gauzy opacities were found in the vitreous, obscuring the fundus very much. There was never any congestion, and but very little pain. Bright light was annoying, particularly to the right (operated) eye. Wishing to remove any fallacy as to the possible influence of nocturnal emissions, I made inquiries, and was told that some time back emissions had occurred, but not often, and that now they were very rare.

For several years he has had frequent attacks of pain in the joints of both great toes, and has also had attacks of lumbago coming on suddenly, so that he could not straighten himself.

His sister, a stout, florid young lady, now (1872) about 23, has had two attacks of congestion in the *left eye* in the early part of this year. She has been liable to rheumatic pains flying about her, and to sciatica, for several years. These symptoms have all occurred on her *left side*. She was once laid up for six weeks by sciatica.

This brother and sister inherit arthritic complaints from both parents. Their mother, a lady of very dark complexion, has

repeatedly and for several years had pain in the great toe joints, and sometimes in other joints. One of her brothers suffered frightfully from "true gout," and another brother had something like gout. The father of these three (the patient's maternal grandfather) also had gout.

The patient's father was liable to rheumatic pains, but had no gout. His father and father's brother (patient's paternal grandfather and great-uncle) suffered badly from gout, and the same is true of a cousin, Lady —, on the father's side.

CASE XLIV.—*Chronic, almost painless Iritis in one Eye at age of 32—Rheumatic Fever and Chronic Articular Rheumatism many years before the Iritis—Gonorrhœa several years after Rheumatic Attacks, and several years before Iritis—No Gonorrhœal Rheumatism—No Syphilis—Gout in a Brother—No inheritance known.*

Edward R., æt. 33, has had one attack of iritis in his right eye; it was in March, 1871. He was in the house for two months, but had very little pain. He came to me in May, 1872, and then had a thin layer of false membrane over the right pupil, and was unable to count fingers with the eye.

At the age of 16 he had rheumatic fever, and three years later was again laid up with rheumatism in his knees. Three or four years after the second rheumatic attack he had his first and only gonorrhœa. It got well in about ten days, and was not accompanied by any rheumatism whatever. Has never had any form of syphilis. He is married, and has five children, reported to be in good health.

Neither his parents nor grandparents had, so far as he can ascertain, any form of arthritic disease, but one of his brothers, now aged over 50, has gout. He knows that one of his grandfathers died blind.

CASE XLV.—*Three Attacks of Unsymmetrical Iritis in a man subject to Rheumatic Pains in the Joints—The Iritis acute, but remarkably free from pain—First attack of Iritis years before any Rheumatism or Venereal Disease—Father arthritic.*

Mr. H., æt. 33, is a florid, fair-complexioned, red-haired man. He has had three attacks of iritis, two in the right eye and one in the left. He came to me in March, 1872, for the third attack.

There were then all the signs of acute iritis, excepting pain. He said that in all the attacks he had been nearly free from pain. When I saw him, the anterior chamber was deep, and the eye was, perhaps, a little softer than the other.

The first attack of iritis occurred eleven years before I saw him, and before he had had either rheumatism or gonorrhœa or chancres. He was salivated for the iritis, and since then he has been liable to rheumatic aching in various joints. The second iritis occurred two years before he came under my care. Eighteen months before I saw him, he had gonorrhœa for the first (?) time, and a slight sore on the penis.

Mr. H. left off beer nearly a year before his last iritis on account of his rheumatism. He stated that twenty years earlier, his father had rheumatic gout in one hand.

CASE XLVI.—*Painless Iritis in each eye in advancing life—Chronic Rheumatic Arthritis of Thumbs—Inheritance of rheumatism from father, and of gout from mother's family—Patient born when his father was past 50.*

Mr. F. C., æt. 55, has iritic adhesions in both eyes, but says that he has never had painful attacks of inflammation in them. He has disorganizing rheumatic disease of the carpo-metacarpal joint of each thumb.

He states that his father suffered much from rheumatism in the shoulders, and that a brother of his mother had gout. He is the youngest of his father's eleven children, and was born when his father was 52 years old. His father died at 72, and had had rheumatism as long as the patient can recollect. Mr. C. has seven children, and none of them have had rheumatism.

CASE XLVII.—*Chronic Painless Iritis in one eye during pregnancy—Rapid and great variations in sight (Accommodative)?—Acute severe Iritis of the other eye soon after the confinement—History of prolonged articular rheumatism and of liability to rheumatic pains.*

Mrs. A., æt. 40, has had iritis once in each eye, with an interval of several months. The left failed first; she states that it was not congested, but the sight became dim, and especially that the degree of dimness varied very much at different times.

This was during her last pregnancy. It recovered after the confinement, and there is now only a single minute tag of adhesion. Two months after her confinement she came to me with severe iritis of the right; there was much ciliary congestion and circumorbital pain. She was highly hypermetropic, and so it is possible that the variations in the sight of the left eye may have been accommodative. She has black hair, dark complexion, and dark brown eyes.

In June, 1870, she had an attack of rheumatism, affecting her ankles, wrists, &c., and lasting six months. Some years ago she had rheumatic pains, which lasted all one winter. She attributed her arthritis to her having been much disturbed at night by her baby's illness. She does not know of any arthritic maladies in her relatives.

CASE XLVIII.—*Relapsing Sclero-Iritis in one eye only—Facial rheumatism—Inheritance of rheumatism.*

Mr. W. was sent to me by Dr. Clapton, on account of sclerotitis and iritis of his right eye. It was his second attack, the first having occurred a year before. He said that the pain in the eye was regularly recurrent every twelve hours, each morning and each evening.

He is subject to lumbago, and often has "brow-rheumatism," always on the right brow. His father suffers from lumbago.

CASE XLIX.—*Liability to relapsing unsymmetrical Iritis and to Lumbago—Chronic rheumatic arthritis of knees—Family history of rheumatic fever.*

Mrs. M., has had four attacks of inflammation in her right eye, and now has slender iritic adhesions and some pigment on the lens-capsule. Her left eye, in which there has been no iritis, is myopic, the right is not so.

She has been liable to lumbago for several years, and had an attack in September, 1871, after exposure to cold; once she was laid up for six or seven weeks by it. She sometimes has crackling in her knees, and on examining them I found condyloid lips. A sister of hers has had rheumatic fever.

CASE L.—*Gonorrhœa—Gonorrhœal Rheumatism—Numerous Attacks of Gonorrhœa—Rheumatic Iritis.*

Thomas Matthews, æt. 23, a sailor, of florid complexion and reddish hair, was under Mr. Hutchinson's care at the London Hospital, in 1863, for iritis and gonorrhœa. He had gonorrhœa for the first time in 1860, and after it a gleet which lasted a long time; he had no rheumatism or inflammation of the eyes after this gonorrhœa. In December, 1862, he again caught gonorrhœa (having been for some time previously quite rid of his former gleet), and very soon afterwards his eyes inflamed. For this attack he was under Mr. Hulke's care, and it would appear from the notes in his letter that he had true gonorrhœal conjunctivitis. About three months later (in March, 1863), and while he still had some urethral discharge, he began to suffer from rheumatism. The right hip and the articulation of his lower jaw were the parts first affected, but the sterno-clavicular joints, the knees, and the back also suffered, and severely; for three weeks he was so bad that he could scarcely sleep. During 1863, after his first attack of inflammation of the eyes, he had thirteen or fourteen distinct attacks of iritis. On November 27, 1863, Mr. Hutchinson's notes state that "he is now just recovering from a severe attack of gonorrhœo-rheumatic iritis in the right eye. He had intense pain in the eye, swelling and discoloration of the iris, but no effusion of nodules of lymph. There are adhesions in this eye. He still suffers much from 'rheumatic pains' in his head and spine. He still has some gleet."

CASE LI.—*Iritis with Rheumatic Pains during Gonorrhœa—Hereditary History of Gout in two Generations.*

John Porter, æt. 22, unmarried, with dark hair and blue eyes, was admitted under Mr. Hutchinson's care at the Royal London Ophthalmic Hospital on December 5, 1870, suffering from iritis in his left eye. The attack began a week before he applied, and was the first of its kind which he had experienced. He gave a history of some conjunctival inflammation (probably catarrhal ophthalmia) in childhood, which lasted for several weeks. On admission, the left eye showed great conjunctival and ciliary congestion, and patches of echymosis were seen on the conjunctiva. The cornea presented a patch of cloudiness at its lower part and

slight haze in other parts; the pupil dilated nearly round under atropine, so that some doubt was felt as to whether he really was suffering from iritis. Three days later, however, there was a well-marked adhesion between the iris and the lens capsule; the haze of cornea had increased.

At the time of admission he had a slight discharge from his urethra (admitted to be venereal) which had been present two or three weeks, and had therefore preceded the iritis; it was, however, so slight that he had taken no notice of it. About the time when the eye began to inflame he had had some pain in the left side of his neck and in his right shoulder. Two years previous he had had his first gonorrhœa; it was severe, and he used injections for it; he had no inflammation of his joints or eyes then. He had never had a chancre.

Beyond the above-mentioned rheumatic pain accompanying his iritis and second gonorrhœa, he was not aware of any arthritic symptoms in himself. His paternal uncle (a warehouseman, and accustomed to the free use of beer) had suffered for six or seven years from gout in his hands and feet; the attacks were described as coming on suddenly, and being attended by pain and swelling. His paternal grandfather (a hotel keeper) was believed to have suffered from gout several times, but no positive history could be obtained. The patient's father had had no arthritic symptoms, though he was a traveller, accustomed to live well and drink beer. The patient believed that he resembled his gouty uncle in face more than his father.

CASE LII.—*Gonorrhœa—Rheumatic Pains—Double Iritis.*

Mr. R., æt. 21, a clerk in the city, contracted gonorrhœa in July, 1870; it was his second gonorrhœa; he had not had syphilis; he was not rheumatic.

After he had been under treatment for two weeks he had aching in some of his joints, and his eyes inflamed. His medical attendant considered that he probably had "gonorrhœal ophthalmia," but expressed some doubt on the matter; "strong drops" were ordered, which gave great pain when used. I was sent for about a week after the eyes had inflamed. The right had inflamed first, but subsequently the left became the worse. The conjunctivitis had much subsided, so much so that Mr. Tay, who first saw him, came to the conclusion that it was gonorrhœo-rheumatic

iritis rather than gonorrhœal conjunctivitis. The symptoms at the first visit were intense pain in and around the globes, especially the left, extreme intolerance of light, much congestion of sclerotic, chiefly in the ciliary region, some swelling of the lips, and mucous discharge; the iris looked muddy, but was inspected under difficulties; with the left eye he could not see my hand. At the next visit, two days later, the left pupil was widely dilated, and there was a ring of pigment deposits on the anterior capsule; he could see to count fingers. The gonorrhœa continued profuse while the eyes were inflamed and for some weeks after they were better.

The occurrence of double iritis suggests the possibility of syphilis accompanying the gonorrhœa in this case; I think, however, that the iritis was rheumatic, and not syphilitic, for the following reasons:—1st, the patient had no other symptoms of syphilis, neither chancre nor rash, throughout the attack; 2nd, the iritic element in the inflammation was slight and transitory, there were no nodules of lymph and no tough adhesions; 3rd, rheumatic pains ushered in the attack of ocular inflammation; 4th, the pain in the eyes was much more severe than it usually is in cases of syphilitic iritis. Neither was it a case of gonorrhœal ophthalmia, for there was never any swelling of the ocular conjunctiva, and but little of the palpebral conjunctiva. The very considerable diminution of sight suggests the possibility of the vitreous having been cloudy during the attack, since neither the cornea nor aqueous were altered, and the iritic adhesions were but slight.

In January and February, 1872, this patient had another attack in his right eye. It was chiefly of the nature of cyclitis, and was attended by great pain and irritability, but no positive iritis.

CASE LIII.—*Gonorrhœo-rheumatic Iritis—The Iritis occurring during the Attack of Gonorrhœa and with Lumbago, &c.*

George Brownjohn, æt. 27, was a patient at Moorfields in April, 1868. The first time he applied "sclerotitis" was diagnosed, but three days later he had decided iritis. The iris was thickened in all parts, and muddy. Its pupillary edge adhered everywhere, but no lymph was seen in the pupil, nor any nodules in the iris. I took it for syphilitic iritis, and on inquiring

whether he had had venereal disease, he at once answered in the affirmative. On examination, however, I found that he had gonorrhœa only. There was great congestion of the conjunctiva, by which the ciliary zone was concealed. He had suffered much pain, but had not much intolerance of light. I had him stripped, and no rash whatever was to be found, nor had he any sore throat. There was a discharge of thick pus from the urethra, but no signs of chancre either within the urethra or in the penis. He denied having ever at any former time had any kind of venereal disease.

As to rheumatism, the facts were as follows:—He had never formerly been liable to rheumatic pains, but for the last fortnight had suffered much from pain in the back of the right hip, passing down the back of the thigh (sciatica). This pain had been present for a week before the iris inflamed. His urine was reported to be thick and high coloured. The gonorrhœa had been present one month.

CASE LIV.—*Gonorrhœo-rheumatic Iritis—Two attacks of Iritis—Two attacks of Rheumatism.*

Wm. Morris, æt. 33, under Mr. Streetfield's care at Moorfields, in March, 1863, with iritis of the right eye. This was his second attack; the first was exactly a year ago, and passed off completely. The present attack is a mild one, and there are no nodules of lymph; he also complains of rheumatic pains in various parts, especially in one knee joint. He has had gonorrhœa four times, and since his first gonorrhœa he has suffered twice from rheumatism, and was laid up for three weeks by one attack in the knees and hips. He never had rheumatism before his first gonorrhœa. He has never had syphilis. It is doubtful in this case whether the gonorrhœa is in causal relation with the rheumatism.

CASE LV.—*Gonorrhœal Rheumatism—Relapsing Iritis—Twenty Attacks—Great damage to the Eyes.*

William Webb, æt. 45, came under my care at Moorfields in 1861. He was of sanguine temperament, but pale and sallow. Excepting his liability to rheumatism and to iritis, he considered that he had enjoyed good health. He had never had syphilis.

In early life he had two attacks of gonorrhœa, and nine months after the second both his eyes inflamed. He was suffering from rheumatism at the time, and the rheumatism had begun within a few weeks of the attack of gonorrhœa. Neither of his attacks of gonorrhœa lasted more than a week or two, and both were uncomplicated. He was treated for his first attack of iritis by Mr. Babbington, in St. George's Hospital, who considered it rheumatic. After the first attack of iritis he remained well only three or four months, when a relapse occurred. He has, on the whole, had twenty attacks, and has usually suffered most during the month of March. Until 1846 he did not experience any material injury to his sight, but an attack during that year was treated without belladonna, and on recovery from it he found his sight much impaired. An attack in the following year damaged his sight still more. Three or four years ago he was obliged to give up his occupation as a draper on account of his defective sight.

The state of his eyes when he first came under my observation was as follows:—With the *right* he could see shadows, but nothing more; the pupil was not larger than a pin's head, and was closed by false membrane; the iris was bulged forward by effusion behind it, and its structure was much altered by stretching. The *left* pupil was excluded and occupied by false membrane, through the centre of which was an aperture sufficient to allow him under favourable conditions to just manage to read.

It seems very probable that in this case the rheumatism was gonorrhœal. He was not aware of either rheumatism or gout in his family. The damage to the eyes had been unusually severe.

CASE LVI.—*Persistent eyeache, in connection with rheumatic arthritis—Arthritis and Gout in patient's mother and maternal uncle—Rheumatic Fever in her daughter—Peculiar Cataract (? Urate of soda) in another daughter.*

Sarah E., æt. 48, is under care for a persistent and very troublesome aching pain in the eyeball; the pain varies in intensity, but is scarcely ever quite absent; she has suffered from it for eight months. It sometimes affects the right side of

the forehead, nose, and occiput; never the left side. She is highly myopic, rather more so on the right side.

She is subject to occasional "rheumatics" in the knees, &c. There are small lips on her femoral condyles.

Her mother (now 85 years old) has had "rheumatism" in her thumb and legs, and her knees have for a long time been so "weak" that she requires help in walking. Her mother's brother died of gout after suffering from it for 20 years. Her youngest daughter has had rheumatic fever (with swollen joints). Her eldest daughter is under Mr. Streatfeild's care for incomplete cataract; the lenses show numerous striæ, and a number of small round opacities apparently distributed all through the lenses. The right is more advanced.

CASE LVII.—*Recurrent iritis in a gouty man—Gout hereditary for two generations on father's side, and confined to males.*

Henry J., æt. 62. During the last 30 years has had many attacks of iritis, chiefly in the right eye. For 35 years has been subject to gout; almost all his joints have suffered. Has lips on femoral condyles and grating in his knees, and gouty concretions in his ears and eyelid. His father, his father's father, some of his father's brothers, and male cousins, have all suffered from gout. He has no brothers, but his sisters are all free from gout. He knows of no female relations who are gouty.

CASE LVIII.—*Rheumatic arthritis on mother's side (mother's brother); rheumatic arthritis and unsymmetrical iritis in her daughter.*

Mrs. C. aged 67. Has had one attack of iritis in her right eye. Is liable to neuralgic pain in the top of her head. Was laid up many years ago, for a month, by rheumatism, and has often since then had slight attacks in her knees. There are abundant loose bodies in the knees; the left grates decidedly, and there are lips on the edges of the condyles.

She has been for many years subject to severe sick headaches. Brown hair, blue irides, sallow skin.

Her mother's brother was confined to his bed for eight years by rheumatism.

CASE LIX.—*Rheumatism in mother's mother; rheumatism, neuralgia, and glaucoma, in mother's daughter—Transmission to same sex.*

Mrs. C., æt. 44. Has her vision very much impaired by chronic painless glaucoma in both eyes; her discs are deeply cupped.

She has suffered a good deal from pain, sometimes definitely one-sided, in the face and head, and from what she calls "rheumatism" in her hands and legs; there has never, however, been swelling of joints. She has been liable for many years to occasional sick headaches.

Her mother's mother suffered severely from rheumatism.

CASE LX.—*Cyclitis and Sclerotitis in a Rheumatic Man.*

John L., æt. 32. Has suffered for nearly a year from a chronic symmetrical cyclitis and sclerotitis (worse in the right eye), ending in thinning and slight staphyloma of ciliary sclerotic.

Several years ago he had rheumatism (probably rheumatic fever), and he has since then been liable to rheumatic pains in various parts. No family history of arthritic complaints. He has had ague.

Dark hair, but little whiskers; light gray irides.

CASE LXI.—*Severe Rheumatism in Father—Rheumatic Pains and Unsymmetrical Keratitis in Daughter.*

Sarah J., æt. 53. Under care for a very chronic attack of keratitis punctata in the right eye. The case has been remarkable for the frequent relapses of pain and ciliary congestion which have occurred.

She is liable to pains in her joints, but has never been laid up by rheumatism. Her father was crippled by rheumatism.

CASE LXII.—*Rheumatic tendency transmitted by father to two sons, and appearing in Joint and Ocular Affections.*

John M., æt. 42. Under care for three months on account of kerato-iritis of his left eye only, with much superficial disturbance (ulceration) of cornea, leading to diffused permanent opacity. The same eye has been inflamed a year ago.

He had pains in his loins and knees at the time his eye inflamed the second time. His brother is rheumatic, and has

had some inflammation of his left eye. His father is subject to rheumatism.

The patient had some chancres some years ago, but there is no evidence of constitutional symptoms having followed.

CASE LXIII.—*Rheumatic Arthritis in mother—Rheumatic Fever, Sciatica, and Acute Glaucoma in daughter.*

Sarah B., æt. 50, was admitted on account of very acute glaucoma of the left eye, which was relieved, and vision considerably improved by iridectomy.

Her arthritic history was to the effect that she had rheumatic fever (with swelling of the joints) at the age of twenty years, and that latterly she had had very severe and localized pain over her right shin bone; "her thumb would have covered the place." Her mother suffered from chronic rheumatism. There was no history of gout.

CASE LXIV.—*Arthritic Neuralgia and Lumbago in father; the same Neuralgia with Joint Pains in two daughters; and Recurrent Iritis in one of them.*

Emily M., æt. 20. Has had recently an attack of inflammation in right eye, and now has iritis in the left, accompanied by much pain. There is no evidence whatever of syphilis. These attacks were in winter.

She is subject to pain in her left shoulder, aching in her knees, and lately to aching of the same kind in her right hand. She also suffers at times from neuralgic pains in both sides of her head. She is "bilious," i.e., liable to nausea and frontal headache.

Her father has lumbago so badly as to be sometimes laid up by it; he also has neuralgia in his head. Her sister has the same neuralgia and rheumatic pains as she has.

Patient has been a barmaid for five years, and is exposed to damp and draughts a good deal.

CASE LXV.—*Arthritic tendency transmitted from mother to son—Rheumatic Iritis, &c., after repeated attacks of Rheumatism in son; all following Gonorrhœa, and perhaps Syphilis.*

Joseph K., æt. 35. Has been often the subject of rheumatism

"in the muscles," and without swelling of joints, since he had gonorrhœa, but he believes never before. Has had gonorrhœa several times, and has had rheumatism at the same time. There is no definite history of constitutional syphilis, though he had a chancre and a doubtful sore throat seven years ago.

For about a year he has been suffering more or less from iritis, first in the right and then in the left eye. Part of this time he has had rheumatism. He has during the same time had a profuse balanitis, and he is under the impression that this symptom comes on spontaneously in connexion with his rheumatism. The iritis has gone on to completely destructive inflammation of all the tunics of the right eye, and the left is nearly blind. His mother had rheumatism in her hips and elsewhere.

CASE LXVI.—*Gout in paternal grandfather; Gout and Kidney Disease in grand-daughter.*

Amy N., æt. 37. Is under care on account of atrophy of the optic disc with diminution of vessels in her right eye, and hæmorrhages into the retina and vitreous in her left. The defect of the right is of only a few weeks' duration; that of the left 12 months.

She has dark brown hair and eyes. She has had an attack of gout in her great toe (was laid up by it), and several times has had pain in it. She is very liable to severe sick headaches, chiefly on the right side. She drinks bitter beer freely. Her urine contains casts, but no albumen. Has never had any rheumatism.

Her father's father had gout. She inherits her sick headaches from her mother.

CASE LXVII.—*Gout in father; Gout, Relapsing Irido-cyclitis, and Neuralgia in daughter.*

Mrs. D., æt. 52. Has had many attacks of irido-cyclitis in both eyes, the left having suffered earliest and most severely and being now quite blind, with increased tension and closed pupil. Both eyes have never been inflamed at the same time. The first attack was eight years ago.

Before her eyes inflamed, and since then, she has had many definite attacks of gout in her left great toe. She is also subject to bad neuralgia in different parts.

Her father had gout in his feet.

CASE LXVIII.—*Recurrent Facial Neuralgia and Unsymmetrical Iritis in a rheumatic woman.*

Mrs. B., æt. 32. For years has been liable to attacks of neuralgia in her face, lasting generally only a few days. Her last attack of facial neuralgia was unusually prolonged, lasting eight weeks, and being followed by iritis on the same side (the right) as the neuralgia. The iritis has been accompanied by pain at the back of the head, but the facial pain has quite left her. Dark hair, brown irides.

Several years ago was laid up by rheumatism in her hips; "has had none in her knees," but there is crackling in the right knee, and there are small lips on her femoral condyles. No known family history of arthritis, but she does not know many of her relations.

CASE LXIX.—*Arthritic Neuralgia in father; the same, with slight Joint Affection, in daughter, with well-marked Iritis in connexion with Syphilitic Keratitis—Influence of the Arthritic Diathesis on the Heredito-syphilitic Eye-affection.*

Mary Anne M., æt. 27, has in a marked degree the physiognomy characteristic of inherited syphilis; she is an only child. She now suffers from an attack of well-marked iritis, with interstitial keratitis in her right eye, and in the left there are widespread but slight choroidal changes.

She often has pains in her joints when she gets cold, and is subject to "sciatica in her leg and shoulder." Her father suffers from sciatica.

Eliza R., æt. 46. Suffers from neuro-retinitis, with hæmorrhages and white deposits in the retina; her urine is not albuminous, but contains casts. The ocular changes began and are more advanced in the left eye. She has suffered from what she calls "rheumatic gout" in the joints of her right upper extremity, and in her knees, to a less extent, for fifteen years; the attacks are often accompanied by a good deal of swelling. She has occasionally had sharp sudden pains in her back, making her loins stiff ("lumbago"). She is liable to stiff necks. Formerly she suffered much (during pregnancies) from severe toothache, often in sound teeth. Complexion sallow, hair dark, irides grey. No family history of arthritis known, but she does not know all her relations.

There is grating in, and much thickening about her knees, and probably lips on the condyles.

CASE LXX.—*Inheritance and Transmission of Arthritis and of Arthritic Eye Symptoms.*

Mrs. J., æt. 72. For twenty-three years liable to "rheumatic gout" in various joints; the attacks came suddenly, and are accompanied by redness, shining, and swelling. In the first attack, she was laid up for several months.

The joint inflammations have often been preceded for a short time by attacks of intense pain in the eyes without impairment of vision. Formerly she had severe sick headaches.

She has lived freely, drinking beer and port-wine. She now has grating, lips, and false cartilages in her knees, and corresponding changes in other joints; xanthelasma of left eyelid; hæmorrhagic retinitis of left eye; casts (but no albumen) in urine. No signs of past iritis. Her mother had "rheumatism" in her shoulders and "in her teeth;" her son's daughter is the subject of the next case.

CASE LXXI.—*Relapsing Iritis in a patient who had syphilis many years ago, and inherits an arthritic tendency.*

Mrs. B., æt. 29. Has had three attacks of iritis in her left eye within the last two years, all of them in winter. Has had occasional "rheumatic pains" for several years, and before the first iritis she had severe neuralgia on the left side of her face.

She had syphilis (rash and sore throat) fifteen years ago, but at that time no inflammation of the eyes occurred. She now has tertiary ulcerations on the left side of her scalp.

CASE LXXII.—*Gout in mother—Slight Rheumatism, Neuralgia, and Relapsing Glaucoma in daughter.*

Sarah H., æt. 23. Is under care on account of glaucoma in her left eye; it has relapsed after a free iridectomy, and a second operation has been performed. The glaucoma has been chronic. She has been, since the age of 10, subject to severe sick headaches. She has also been subject for some time to neuralgia in connexion with carious teeth. Both eyes are extremely myopic,

the right has for many years been nearly blind, and its disc is now atrophied.

She considers herself slightly rheumatic in her joints. Her brother has slight rheumatism. Her mother has "chalk-gout," and formerly had severe headaches.

CASE LXXIII.—*Gout inherited by the youngest child—Pain in the eyes in connexion with Gout.*

William B., æt. 51. Is subject to attacks of gout, and suffers from "darts of pain through the middle of each eyeball" in connexion with his gouty paroxysms. These pains are generally confined to the eyeballs, but sometimes they cross the bridge of the nose. He never has the pain except when he has gout.

His father suffers severely from gout, and his father's five brothers all suffer from it. The patient is the youngest born of his father's children. He has drunk beer from childhood.

CASE LXXIV.—*Gout in mother—Scarlatinal Rheumatism in children.*

Mrs. B., æt. 62. Is under care for renal retinitis which affected the left eye first, and subsequently attacked, in an exactly symmetrical manner, the right. She has albuminuria. She has been liable to attacks of gout for twenty years. She states that those of her children who have had scarlet fever have suffered from rheumatic fever afterwards.

CASE LXXV.—*Gout in father—Recurrent Iritis and other recurrent symptoms in son.*

William Y., æt. 54. Has had attacks of subacute iritis several times within the last six years; the right has suffered most, and is all but blind. He has had no definite joint disease, but slight "rheumatic" pains in various parts. Has been, since boyhood, very liable to epistaxis, and to violent sick headaches, and to indigestion. He has nearly black and rather coarse hair; and is getting bald on the vertex. His teeth are carious. His father was often laid up by sudden attacks of gout in his feet.

CASE LXXVI.—*Transmission of Arthritic Diathesis to two generations, from father to daughter, and daughter to son—Gout, sciatica, and recurrent iritis, and rheumatic fever, in different members of the same family.*

Mrs. A., æt. 51. Has had two attacks of iritis in her right eye within the last six months; there has been very little pain. She is subject to shooting pains down the backs of her thighs and legs. Two years ago she had an eruption of herpes frontalis on the left side, and she often has a crop (as she now has) of herpes on the end of her nose during a cold. She is florid and has dark hair.

Her father had well-marked gout, and her son has had rheumatic fever. She says that she resembles her father, and that her son resembles her more than his father.

CASE LXXVII.—*Occurrence in the same patient of Gout, Rheumatic Fever, and Chronic Rheumatic Arthritis, with (later in life) numerous attacks of recurrent Iritis—Gout in a paternal ancestor.*

Wm. T. M., æt. 50. Has had about six attacks of iritis; they have always been unsymmetrical, sometimes one eye being attacked, sometimes the other. They almost always occur in January. He first suffered at about the age of 22.

He has been subject to well-marked attacks of gout since he was 7 years old: the first was in his right foot. He has had no gout attacks since he was 35. This freedom during advanced life is probably due to his having drunk nothing but gin-and-water since he was 22.

He has had three attacks of rheumatic fever; the first came on after he got wet on a hot day. His first attack of eye-inflammation occurred with the rheumatic fever. "The doctor used to listen to his heart." The last rheumatic attack was at the age of 34 (*i.e.*, about the same time as the gout ceased). Respecting the character of the rheumatism, he says that he was sometimes laid up for many months by it, and that his joints swelled but did not become shining as he was accustomed to see them in gout.

His later attacks of iritis have not been associated with any joint symptoms.

His father's father had gout severely, but his father and all other relatives are believed to have been free from both gout and rheumatism. His father was a "brass-founder," and the patient is the same; "brass-founding," he says, includes working in lead, copper, and arsenic. He has never had symptoms of lead poisoning.

Patient has some grating in his right knee, and there are three (probably) small lips on the condyles.

CASE LXXVIII.—Several Attacks of Rheumatism and Unsymmetrical Iritis during corresponding Attacks of Gonorrhœa—At a later period, Iritis with Sciatica, without Gonorrhœa—Mother slightly rheumatic.

George D., æt. 27, a single man, had rheumatism for the first time during his first gonorrhœa, at the age of 20. At the same time his left eye inflamed for the first time, and afterwards the right eye. He was, during this illness, under Dr. Page's care at St. George's Hospital, where the diagnosis of "gonorrhœal rheumatism" and "rheumatic iritis" was made. Since the above date he has had three or four attacks of gonorrhœa, and with each gonorrhœa he has had rheumatism and inflammation of one eye. He now comes under care for his fifth attack of iritis. It is in his left eye, and he says that of the five only one has been in the right; he has no gonorrhœa now, and has had none for about three years. Besides the iritis, he now suffers from sudden attacks of severe pain at the back and upper part of the right thigh; it "makes him feel as if he should fall." The present attack of iritis has not been accompanied by much pain. He states, with regard to the rheumatism, that almost all his joints have been affected at one time or another, but that his right side has on the whole suffered more severely than the left, the reverse of what has happened to his eyes.

The diagnosis of the cause of his iritis is made more difficult by the presence on his legs, arms, and abdomen of a rash, consisting of dull maculæ. It may be the remains of a syphilide or of common psoriasis. He says it has been present eighteen months, and that he never had a rash before. Whether or not he had syphilis two years ago or thereabouts does not matter much, since his earlier attacks of iritis occurred more than two years ago, and in association with gonorrhœal rheumatism.

His mother, who is 45, has had "rheumatism" in her hands twice; "she caught it at the seaside."

CASE LXXIX.—*Ten annual attacks of Unsymmetrical Iritis always in the same Eye, and probably located in it by over-use—The Iritis always occurring in Spring time—Patient suffers from severe Facial Rheumatism—No known Family History of Arthritic Diseases—Syphilis without Inflammation of Eyes 14 years before first attack of Iritis.*

A medical friend has had six attacks of iritis within the last ten years. They have all been in the right eye, and the left has never suffered. The iritis always occurs in or about the month of March; it is accompanied by intense pain and great photophobia. Each attack lasts about three weeks, and is followed by complete recovery; so that now, after his sixth attack, the right eye is still better than the left for microscopical purposes.

Dr. Z. has suffered much from facial rheumatism, and for a long time he limped about lame with sciatica. He has had no other form of arthritis, and states that, so far as he knows, gout is not in his family.

Dr. Z. believes that the iritis has been located in his right eye in consequence of his having used only that eye for microscopical work, of which he has done a great deal; he has never used the left eye for this purpose.

Fourteen years before his first iritis Dr. Z. contracted syphilis, from a chancre on the finger, during his attendance on a midwifery case. He had no well-marked secondary symptoms, and no affection at all of the eyes. For the next 10 years, however, he suffered more or less from palmar psoriasis (symmetrical), and occasionally from other tertiary symptoms; but all signs of syphilis wholly disappeared after a course of mercurial baths four years before the iritis began.

Although the iritis in this case has occurred in an arthritic subject, it may perhaps have been to some extent influenced by his syphilis, for great benefit has several times seemed to follow from large doses of iodide of potassium, and once from the administration of mercury to slight salivation.

CASE LXXX.—*Slow painless unsymmetrical Kerato-iritis (Keratitis Punctata), in a woman, æt. 49, who has been subject to Chronic Rheumatism since girlhood—Sick headaches and various nervous symptoms since puberty—Hereditary history of Rheumatism and of Skin Disease—Patient possibly Syphilitic after marriage.*

Mary Anne W., æt. 49, suffers from well-marked keratitis punctata of her right eye only; the dots on the posterior lamina are chiefly at the lower part. The iris has a slightly greenish tint, but shows no undoubted signs of present or past inflammation. The opposite iris is of a bright brown colour. The tension is slightly increased. The eye has been failing for about 12 months. She has had neither pain nor redness in it. It is her first attack. She has dark hair, brown irides, and a sallow complexion.

Since girlhood she has suffered from rheumatism. Her right shoulder was the first part attacked (and is still oftenest affected), and since the left wrist and both knees have suffered; her feet also sometimes get stiff and painful. Since the age of 16 she has been subject to sick headaches, with vomiting; of late years she has several times had attacks of temporary dimness of sight, lasting a few minutes, and of numbness in her hands and feet. She never had jaundice, and has no xanthelasma.

There is no evidence of inherited syphilis in her physiognomy or teeth. With reference to tertiary acquired syphilis, however, there is suspicion, though no conclusive evidence. She has had five children: one was born dead, one died a few hours after birth, and another at 14 months. The remaining two do not appear to have shown suspicious symptoms.

The patient's mother suffers from "rheumatism" in her back; and her eldest living child, a boy of 10 years, is attending at the hospital for skin-diseases on account of an eruption, which, from the mother's description, is probably psoriasis.

CASE LXXXI.—*Iritis in one eye, at the age of 48, in a woman who is very probably the subject of latent Syphilis from Conception—Family history of Rheumatism and Gravel—Various nervous symptoms and a Skin-eruption in the patient, all probably in connexion with the climacteric period.*

Mrs. W., æt. 48, came under care for iritis, of only a few

days' duration, in her right eye; it was accompanied by severe pain and by ciliary congestion. The sight of this eye had been failing for the previous 12 months, and on examination striæ were found in the lens. She had never had inflammation of either eye before.

She has had occasional pains in her loins, but no other symptoms which at all pointed to an arthritic tendency. Menstruation ceased two and a half years before she came under care, and since that time she had noticed that her memory was failing (she stated this voluntarily), and she had become liable to frequent attacks of what she called "hysteria." The following is her account of such an attack:—For a day or two she feels out of temper and has a bad taste in her mouth; then comes a feeling "of coldness all over," accompanied by laughing and crying, and lasting perhaps 24 hours. After the cold fit is over she becomes "feverish" and goes to bed, but does not sweat. This "fever" often lasts as much as three weeks. Soon after it begins the *right* leg swells and becomes red and hot, and red patches appear on the skin; her account of this eruption is indefinite, but it is probably eczematous, for when she came under care she had recently had such an attack in the right leg, and for the first time in the left also, and there were stains remaining just like those left by eczema. She also describes a feeling of "numbness," which "takes her all down the right side" during these attacks.

She has had very good health in other respects, and no history of syphilitic symptoms can be obtained, but her children are in all probability syphilitic. She has had 13 pregnancies; several ended in miscarriages, and several children died at about 12 months; the three living ones all had "thrush," but none have had suspicious symptoms since infancy.

Her father suffered from "rheumatism" in his arms, and he died of "gravel." The patient knows of no other arthritic history and of no history of skin-diseases, but she does not know all her relations.

CASE LXXXII.—*Several attacks of Chronic Iritis in the same eye at an early age, and ending in exclusion of the pupil—Family history of Gout and Rheumatic Fever.*

Mrs. W., æt. 22, married three years, has dark hair, blue

irides, and pale complexion. She has had four attacks of iritis in her right eye since the age of 16, and a single mild attack in the left at the time when the right was last inflamed. During the earlier attacks she was under the care successively of Mr. Crichett and Mr. Jabez Hogg. The pupil of the right is excluded and the iris bulged forwards. The attacks have generally begun about October, and persisted with varying severity till April or May; sometimes there has been much ciliary congestion; pain has not usually been a prominent symptom. The first attack occurred three years before marriage.

She herself has had no arthritic symptoms, if we except slight aching in her left shoulder. She has two brothers, one of whom (who, like herself, has dark hair) has had rheumatic fever severely. Her father, who was a physician, suffers from gout in his feet. He is known to have drunk very freely. The patient is said to be "exactly like her father" in features and colour of hair.

With regard to syphilis, there is no evidence that the patient has shown any symptoms of it, although it is highly probable, from her account, that her two children are syphilitic. She has been pregnant twice: the first child, a boy, died at the age of one month of "thrush," and he had an eruption on the buttocks; the second, a girl, is living; she had thrush, but no eruption.

The patient had, it is true, one of her iritic attacks (the third) soon after her second confinement; but seeing that her first attack was three years before marriage, that the first three attacks were unsymmetrical, and that a strong family tendency to arthritis exists, we need feel no hesitation in ascribing her iritis to the arthritic diathesis.

CASE LXXXIII.—Kerato-Iritis of one eye in a man whose male relations are rheumatic, and himself probably slightly so—The attack attributed definitely to cold—History of an eye disease in his rheumatic brother.

John M., a stoutly-built, florid livery-stable-keeper, æt. 42, applied on account of kerato-iritis of one week's duration in his left eye. There was then (January 16) intense conjunctival congestion, a large surface of very superficial ulceration at the centre of the cornea, and white interstitial deposits in it; the iris

was discoloured, and adherent at several parts to the lens-capsule. The cornea afterwards became superficially vascular, and after the vessels disappeared, extensive opacity of cornea still remained. The attack was accompanied by considerable pain at first. He had pain in his loins and knees at the time when the iritis began, and he attributed the whole attack to a "cold," which he thought was caused by having had his hair cut a few days before. He stated that he had an attack of inflammation in the same eye about a year before the one for which he came under care; but it lasted only a few days on the first occasion.

The patient has lived freely in regard to alcoholic drinks, but has never had gout. There was no evidence that he had ever had constitutional syphilis, though he admitted having had some "little sores" many years before. He stated that his father and his brother had both suffered from rheumatism, and that the brother had also had something amiss with one of his eyes.

CASE LXXXIV.—*Recurrent Iritis in a slightly arthritic woman—Gout and hemiplegia in her father, and rheumatic fever in her son—Herpes frontalis and repeated attacks of symptomatic herpes in the patient—The herpes frontalis on the side opposite to her iritis, and on the same side as her father's hemiplegia.*

Mrs. A., a widow, æt. 51, had her first attack of inflammation in the right eye in August, 1870, and the second in December and January following. She came under my care on January 5, 1871, and then had well-marked iritis in her right eye, with numerous but not very tough adhesions. She was well in three weeks, and neither this nor the former attack were attended by much pain.

My attention was attracted to some scars on the *left* side of her forehead, chiefly in a vertical line at the middle of the left forehead, evidently left by an attack of herpes frontalis. She stated that the eruption came out two years before I saw her, and soon after the final cessation of the catamenia. She said that there were no spots on the nose or face, and that the eye was not affected. The eruption was probably not copious, and was not followed by either pain or numbness. It is curious and interesting that she is also very liable to crops of symptomatic herpes in connexion with colds; these eruptions do not specially affect

one side, but they are peculiar in usually appearing on the end and ala of the nose, and *not on the lips*. This is her own account, and was borne out by the presence of such a patch on the *left* side of the tip and ala of the nose in connexion with a "cold," at her last visit.

This patient is liable to shooting pains in the backs of her thighs and legs (sciatica), and to occasional stiff neck, but not to any other arthritic symptoms; unfortunately I did not examine her knees. She considers that her health has been good, except a liability to frontal headache, with vomiting, which began in early girlhood, and has entirely ceased of late years.

Her father, who was an independent gentleman, suffered from gout; he had several "fits," and finally died in one of them. He was paralysed on his left side. The patient's son (the only son out of four children) has had rheumatic fever.

The patient is stout and florid; she has dark hair and brown irides. She states that she "takes after her father," and that her son resembles his mother more than his father.

CASE LXXXV.—*Chronic Ciliary Sclerotitis in a man who formerly had rheumatism severely, and still suffers from it in a less severe degree.*

John L., æt. 32, formerly in the East India Company's Service, now a ticket collector, came under care on account of conjunctival and sclerotic congestion, chiefly in the ciliary region; it was noted that there was but little mucous discharge. A week later there was some superficial vascular ulceration of the upper part of the left cornea. The inflammation had come on gradually for about a month before he applied, and was at first attended by a good deal of pain. He remained under care for nearly a year, the congestion very gradually disappearing (except a varicose state of a few large emerging veins), and giving place to a thinning of the corresponding part of the sclerotic. Thus, in the ciliary region of each eye, there was a ring (incomplete above), or narrow belt of sclerotic which had become thinned and allowed the black choroid to show through it; this change was more marked in the right eye, which had throughout suffered more than the left. The thinning was not accompanied by any appreciable bulging of sclerotic. The thinning did not extend

quite up to the corneal edge, but a narrow ring of normal white sclerotic intervened between the cornea and the diseased part.

This man had severe rheumatism, probably from his account rheumatic fever, several years before the inflammation of his eyes, and while in India. He also, in the same country, had many attacks of ague. He stated that he had been liable to attacks of rheumatism in a slighter degree since his rheumatic fever. He had black hair, dark, rather sallow complexion, and light grey irides.

He was not aware of any arthritic history in any of his relations.

CASE LXXXVI.—Iritis in one eye in an old woman—History of severe rheumatism, and presence of chronic arthritis in the patient—Patient subject to bad sick headaches, and has had jaundice—Family history of rheumatism.

Mrs. C., æt. 67, has had one attack of iritis in her right eye. I treated her for it in January, 1871; the iris was adherent in many spots to the lens-capsule; there was no corneal change whatever.

She has brown hair, blue eyes, and a rather sallow complexion. She states that many years ago she was laid up for a month with what she calls rheumatic fever; it affected various joints, but especially the knees. Since then she has never been laid up by rheumatism, but has often had pains in her knees, especially in spring and autumn. Both knees have been equally bad. She now has great thickening of synovial membrane in both knees, and abundance of pedunculated bodies can be felt in the joints. The condyles cannot be distinctly felt for lips on account of the synovial thickening, but both patellæ are irregular on their front surfaces and borders, from bony outgrowth. The left knee grates very decidedly on movement. This patient has been liable since about the age of 24 to sick headaches; they were formerly much more severe than they are now. She has often noticed that her sight became dim for a time during the headaches, and of late years has sometimes had numbness in her hands and feet. Several years ago she had jaundice.

Only one relative, so far as she knows, has ever had any arthritic disease. This was her mother's brother; he was very

rheumatic, and was confined to bed for eight years by rheumatism.

CASE LXXXVII.—*Iritis in a woman who is subject to severe neuralgia of the 5th nerve, and has rheumatic arthritis—Family history of “rheumatic gout.”*

Mrs. B., æt. 32, came under my care in January on account of iritis in her right eye of about six weeks' duration. There were also peripheral opacities in each lens, but no signs of iritis in the left eye. She told me that for many years she had been liable to attacks of neuralgia in the face, lasting generally only a few days. She said, however, that she had had an attack of this pain of unusual length before the eye inflamed; it had been on the right side of her face, and she referred it to the roots of the upper teeth; it lasted for eight weeks on and off. The face got quite well for a week or so before the eye inflamed. When, however, the iritis began, she again had most severe neuralgia of the forehead and back of head on the right side; she was laid up a fortnight with the pain in the head and eye.

About five years ago she was laid up for a week with rheumatism in her hips, but has had no other inflammation of her joints. There are, however, small lips on the inner condyles of her femurs, and her right knee cracks freely when she moves it.

She states that her mother's father had “rheumatic gout;” her mother, who died at the age of 53, is believed not to have been arthritic.

(To be continued.)

CASES ILLUSTRATING THE OPHTHALMOSCOPIC APPEAR-
ANCES OF SYPHILITIC CHOROIDITIS.

By JONATHAN HUTCHINSON, F.R.C.S.

IN the accompanying ophthalmoscopic plate three illustrations are given of the different forms and stages of disseminate or patchy choroiditis in connexion with syphilis. In two the taint had been acquired by the individual, in the third it was inherited. As I purpose shortly to give some general remarks of the forms of choroidal disease which occur in syphilis, the stage of malady at which they are met with, and the best means of differential diagnosis, I shall for the present content myself with simply recording the notes of the cases to which the portraits belong.

CASE I.—*Syphilitic retinitis with Keratitis punctata seven months after primary symptoms—Perfect recovery under treatment—Choroiditis disseminata four years later—Extravasated blood at yellow spot.* Portrait of fundus (Fig. 1, plate iv, vol. vi).

Mrs. Middleton, then aged 27, was admitted at Moorfields in February, 1845. She had suffered from syphilis in June of the previous year. At that time she had sores in the genitals, sore throat, and a copious rash. These symptoms had wholly disappeared when she applied to me for her eye, and the only other indications of syphilis then present were hoarseness and loss of hair. Her right eye ailed nothing. On the posterior lamina of the left cornea were three or four little white dots of deposit. The vitreous was clear, but the retina was generally hazy, and the margins of the disc were wholly concealed. There were no extravasations. From her account it appeared that the eye had been inflamed for two months or more.

The prescription consisted of six grains of iodide of potassium and two drachms of the solution of bichloride of mercury three times a day. It was continued steadily from February 28 to May 4. At the latter date she could read ^{brilliant} with the



Fig. 1.



Fig. 2.



Fig. 3.

E. Burgess del. adnat. et lith.

W. West imp.

SYPHILITIC CHOROIDITIS.

affected eye, having at the beginning been able to read only No. 12. The corneal deposits had wholly disappeared, and, excepting a slight indistinctness at the margin of the optic disc, the retina had wholly cleared. The other eye continued quite well. The patient had been made the subject of a public demonstration during the early stage. I find added to my notes at the date of her discharge, "If I had examined the eye without knowing the previous history, I think I should have considered it quite normal."

In January, 1869, exactly four years after her first attendance and nearly five from the first syphilis, Mrs. Middleton again applied. It was now the right eye which was affected, the other had continued quite well. She had taken no medicine since her former attendance and had enjoyed good health. Her right eye had been failing for about six months; she had during this time been much troubled with "blacks flying before it," and had also experienced some pricking pain in it. With the right she could but just count fingers, and only when held to the temporal side. Looking forwards she could not tell black from white. With the left she read ^{brilliant} but not easily. There were no iritic adhesions. On the examination with the ophthalmoscope (January 11, 1869) we found the right choroid spotted over with small white or yellowish-white patches. These patches varied somewhat in size, looking, most of them, about as large as shot corns, but some much less. With but very few exceptions, none of them showed any pigment either at edges or on the surface. The retina was at most parts quite clear. The yellow spot was of a dull grey-brown from the remains of a blood-clot; above and below it some traces of recent blood remained. The appearances are well shown in a drawing which Mr. Burgess made for me. The retinal vessels were of normal size, the disc a little pale, but not much so.

March 6. There has been a little improvement under treatment. She can now see the bars of the window and distinguish colours. She still cannot see $\frac{2}{200}$ nor count fingers. The blood has been absorbed, but at the yellow spot an ill-defined grey patch marks a local separation of the retina (?). The choroidal patches have somewhat increased in number, and have scarcely changed in character. Scarcely any of them show any trace whatever of increase of pigment, and where it does occur it is in

the minutest dots. The other eye is perfect, and no choroidal patches can be found.

This case is of value—

1st. Because we have the full history of the patient's attack of syphilis.

2nd. Because it well illustrates the relationship between retinitis and choroiditis: the one a secondary symptom, the other occurring in the tertiary stage.

3rd. On account of the interval of absolute latency as regards syphilitic symptoms. Had the patient come under the care of a surgeon to whom she was not known, and had she denied syphilis, there would have been nothing whatever by which to establish the diagnosis. She had no other symptoms, and looked florid and well.

4th. We have an illustration of the fact that tertiary syphilitic lesions are often or usually unsymmetrical.

5th. It is of interest to note the almost entire absence of pigment disturbance.

CASE II.—*Choroiditis disseminata in a late stage and in connexion with Constitutional Syphilis.*—(Portrait, Fig. 2, plate IV.)

I have unfortunately for the present mislaid my notes of this case. I can only state from memory that the portrait shows the fundus of a patient who had many years ago suffered from acquired syphilis, and in whom the results of choroiditis were seen in the stage of atrophy. All traces of lymph had been removed and abrupt white patches remained, the whiteness being due to the exposure of sclerotic. Many of the patches showed pigment accumulations, but in many there was none whatever. The patches near to the disc and about the yellow spot were most of them of considerable size, but towards the periphery were large groups of exceedingly small ones.

CASE III.—*Heredito-syphilitic Choroiditis disseminata—Characteristic physiognomy and teeth—History of remarkable infantile mortality.*—(Portrait of fundus, Fig. 3, plate iv, vol. vii.)

30th September, 1869.—Emma Gamm, æt. 17. Her physiognomy and teeth were most characteristic. She was the oldest

living, five born before her having all died (three still-born). Six since had been born alive, and of these only one was now living.

The only other living child was a boy, now aged 7, who had never suffered from his eyes, and who had enjoyed good health. None of those dead lived to be older than seven months.

With her left eye she could but see shadows, with her right she read $\frac{20}{200}$. There was a strong divergent squint, which was stated to have been present from childhood. Her right first inflamed at the age of seven (probably interstitial keratitis).

When an infant, Emma G. suffered much from a sore mouth and from snuffles.

A sketch was taken of her left eye as a good example of choroiditis disseminata from syphilis. The fundus was speckled over with patches of absorption with pigment deposit. These were placed very irregularly. One was seen just below the optic disc. Some of the patches were round, sharply defined, without pigmentation. The patches were very abundant at the extreme periphery, then occurred a belt of choroid, which was almost free, and next, near the centre, were numerous, irregularly-placed patches, as seen in the sketch.

In the right eye the patches were much fewer in number.

There were a few very slight iritic adhesions in the right eye.

NOTE.—In a few cases of myopia patches, almost precisely similar to those seen in such cases as the present one, are met with. But the patches are arranged differently in the two cases. In myopia they are almost always seen chiefly at the position of the yellow spot, whereas in syphilitic cases they occur irregularly, and are almost always abundant at the extreme periphery.

CASES SELECTED FROM HOSPITAL PRACTICE.

CASE I.—*Wound of eyeball, with fracture of orbit, ending fatally.*

Under the care of Mr. HUTCHINSON.

The following case was, whilst the patient was in our wards, one of great interest and obscurity, nor was the latter element wholly removed by the autopsy. At first we had no suspicion that the lesion was more than panophthalmitis after wound of the eyeball by a chip of metal. It was thought not unnaturally that the man's general symptoms, sleeplessness, &c., were in part due to the moral shock caused by the accidental loss of the only eye he had left. When it became evident that they meant more than this, the suspicion was aroused that the foreign body might have been driven through the eyeball and also through the walls of the orbit. A search disclosed the fact that the orbital wall was indeed fissured, but did not lead to the discovery of the cause of the damage.

SYNOPSIS.—*Wound of eyeball and fracture of inner wall of orbit into ethmoidal cells by a chip of iron—Excision of eye on second day—Suppuration of orbit for three days after excision—Intense pain in head and back with high temperature, beginning on 6th day after the accident—Exploratory operation—Death on 18th day—Abundant recent lymph in subarachnoid spaces—Abscess between orbital periosteum and roof of orbit, with discoloration of the latter—Foreign body not found—No well-marked paralysis.*

(Notes by Mr. NETTLESHIP.)

William N., æt. 33, a worker at an iron factory, was holding a piece of cold iron which another man was hammering, when a chip of iron broke off and struck his left eye. Sight was immediately lost, and severe pain set in very soon after the accident. His other eye had been lost and excised eight years before by Mr. Hutchinson after a similar accident. In the present instance

he was taken first to the Westminster Hospital and placed under the care of Mr. Francis Mason, by whom he was transferred, at his own request, to Mr. Hutchinson, at the Ophthalmic Hospital. The chip of iron was believed to be still in the eye at the time of his admission under Mr. Hutchinson's care, 48 hours after the accident. He was then very ill, partly from the severe continuous pain and partly from the state of extreme mental depression into which he had been thrown by the occurrence of sudden, total, and permanent blindness. The lids of the left eye were much swollen, and there was a small recent vertical wound on the edge of the lower lid near the outer canthus. The eye was quite lost, and there was a large wound at the lower and outer part of the globe involving the outer part of the cornea and the ciliary region of the sclerotic. The greater part of the contents of the globe had already escaped. On dissection of the eye after excision, a layer of recent lymph was found on the choroid; the choroid and sclerotic were oedematous and infiltrated with yellowish purulent-looking matter, and a thick layer of the same puro-lymph lay between the two coats. The lips of the wound in the sclerotic were thickened and rounded. There was no wound other than the one mentioned above. During the next three days the cellular tissue of the orbit swelled considerably and suppurated freely, and he had some pain in the part, but on the 4th day after the excision the orbit looked quite healthy and the pain had quite left him. During this day, however, the 4th *after the operation and 6th from the accident*, he began to complain of intense pain just behind his left ear. When questioned as to a rigor, he said he had felt cold and shivering, but not enough to make his teeth chatter. In the evening his T. was 102·4. The next day (7th *from the accident*) the pain continuing, he was freely leeches at the left of the occiput, with some relief to the pain. In the morning, T. 103·2, evening, 104·.

On the 8th day, in the morning, T. 102·6, evening, 103·1.

9th day, morning, T. 102·, evening, 103·5. The pain during these two days remained much the same as before, and the subsequent attacks from which he suffered were of the same kind. He described his head as constantly aching moderately, but this moderate pain was bearable and comparatively trivial. Every two or three hours, however, he had a paroxysm of intense agony, during which he trembled all over, screamed out, and

at times became almost unmanageable; indeed, towards the end, he became quite delirious during these exacerbations. He said he felt as if during these attacks his skull would split or come off, or as if a horse were constantly kicking him on the head.

10th day, T. morning, 102. During the night of the 10th day he had a very severe attack of pain in the lower part of his back,—a “craunching pain;” he asserted that during this pain his left leg was drawn up for a short time so that he could not straighten it. The pain in the back continued at intervals after this date; it seemed generally to precede a paroxysm of headache. To-day he began taking 10-grain doses of bromide of potassium every second hour.

11th day, it was noticed that there was no paralysis, there had been no sickness, his bowels were fairly open, and he was taking some food, though not much. Tongue moist, but rather furred. His wife asserts that just before the severe attacks of pain in the head his neck and face turn very red, remain so during the attack, and become pale again when the headache abates. In the morning, T. 102·6, P. 82, R. 22; evening, T. 101·8, P. 80.

12th day. Early in the morning a hypodermic injection of morphia was given to relieve the horrible pain; he slept well after the injection for about six hours, when the pain returned. Mr. Hutchinson then explored the orbit, and found a fracture of its inner wall involving the ethmoid bone and opening into the ethmoidal cells; some thin fragments of loose bone were removed, but no foreign body could be found. Air bubbled up through the fracture when he coughed and his nostrils were stopped. Some weakness of the facial muscles on the right side was noticed while he was under the influence of chloroform. The pain returned with increased severity after the operation, and he became occasionally delirious; between times he was extremely despondent. In the morning (before the operation), T. 103·4, P. 120; evening, T. 103·8, P. 120. After the exploratory operation he was ordered to take 1 grain each of calomel and opium every four hours.

13th day, morning, T. 101·8, P. 98; evening, T. 101·8, P. 96.

14th day, morning, T. 100·4, P. 86; evening, T. 101·9, P. 72. During these two days he had much less pain, being partly under the influence of opium; morphia, however, was injected twice.

There was a little spasm of the vesical sphincter, probably from the opium. It was noticed that for about an hour before the paroxysms of pain, and during their continuance, his feet became very cold. There were still no signs of paralysis, except the somewhat doubtful weakness of the right facial. The pills were discontinued after the evening of the 12th day on account of free purgation. He was not salivated.

15th day, morphia again required. In the evening he was semi-comatose, and began to pass his urine and fæces unconsciously. He frequently moved the left leg, but it was noticed that he generally kept the right lying flat on the bed. In the morning, T. 103, P. 90; evening, T. 101.1, P. 80.

16th day, partly conscious, seemed to understand what was said to him, but could not articulate words clearly. Only occasionally complained slightly of his head. Diarrhœa continued. Paralysis of sphincters as before. Reflex action of right leg decidedly feebler than that of left. In the morning, T. 103, P. 80; evening, T. 104.4, P. 96.

He died in the morning of the 18th day after the accident. There had been no new symptoms of any importance.

The reader's attention may be asked to the following points in the above rather lengthy narrative:—1st, that the man suffered most intense pain in his head, and that it began on the injured side; 2nd, that there was no definite paralysis of any muscle or limb; 3rd, that throughout there was but very slight acceleration of pulse.

Examined five hours after death. Only the head was inspected. There was abundant recent lymph in the subarachnoid space at the base of the brain, and extending thence along each sylvian fissure to the upper surface of the anterior lobes, where it ceased to form a continuous layer, and occurred only in a few scattered patches between the convolutions, chiefly on the left side. Many of the nerves at the base of the brain were cased in lymph, notably the seventh pair, which were covered with inflammatory material quite up to the internal meatus. The layer of lymph became much thinner over the pons and medulla, and seemed likely to disappear entirely in the upper and middle part of the cervical region. There was no trace of lymph in the arachnoid space anywhere. There was a distinct layer of lymph on the choroid plexus in the descending horn of the right ven-

tricle, and the corresponding part on the left side was discoloured as if from infiltration, but there was no layer of new material upon it visible to the naked eye. The brain substance everywhere appeared quite healthy. There was nothing amiss with any part of the dura mater so far as could be ascertained by naked-eye examination. The bone forming the roof of the left orbit, over a patch as large as a three-penny piece, just to the left of the cribriform plate, was discoloured and dark. Between this discoloured patch of bone and the orbital periosteum beneath it there was a small circumscribed collection of pus. The rest of the roof of the orbit looked healthy, and it is well to repeat that the dura mater covering the discoloured portion of bone was neither thickened nor altered in colour. The optic nerve of the left side and its sheath were carefully examined, but no trace of pus visible to the unaided eye could be seen between the nerve and its sheath in any part, and the nerve itself appeared normal. There was no pus or lymph in the sphenoidal fissure or cavernous sinus. In the sphenoidal sinus there were a few drops of opalescent yellowish fluid, looking as if it contained a little pus, but there was no thickening, redness, or other discolouration of the mucous membrane of the sinus. This sinus, as well as the ethmoidal cells, nasal cavity, and orbit were carefully searched, but no foreign body could be found.

CASE II.—*Case of Paralysis of the fifth nerve in a boy. No diagnosis as to cause.*

(Under the care of Mr. STREATFIELD; notes by Mr. HUGGINS.)

Charles Orwell, æt. 13. Patient has never been ill until about seven weeks ago, when he had what his mother describes as low fever; he was ill a little over five weeks, but was only confined to bed four days. He has now been convalescent about ten days. There is no history or appearance of congenital syphilis. He is a good-looking, well-grown lad, is rather pale, and gives one the idea that he has been ill; says that about a week ago he noticed the left eye bloodshot, but neither irritable nor painful. He went to a doctor, who ordered him poppy lotion, and applied a blister to the left temple. He afterwards went to a chemist's, and got some lotion to drop into the eye.

Three days ago, the sight of the left eye began to fail without pain or any photophobia.

At present there is a large opacity (of an oval form, having a greyish-white shining surface, and being very dense), occupying the centre of the cornea, but having the pupil clear at its upper margin. (The opacity is thought to be due to lead.) There is pus in the anterior chamber and on the surface of the iris, the pupil is of moderate size, circular, and fixed; the conjunctiva red and swollen, with some muco-purulent discharge. There is no intolerance of light.

Sensation is entirely lost on the surface of the cornea and conjunctiva, also on the left side of the face, the anæsthesia extending vertically from the chin and ramus of the jaw to the top of the head, laterally from the median line to the ear, with the exception of a space bounded in front by a line drawn in a curved direction from the external auditory meatus to about the point where the facial artery crosses the ramus of the jaw. Sensation is perfect on the surface behind and below this line, and is continuous with that in the neck. Above the ear the anæsthesia is limited laterally by the temporal ridge. There is complete anæsthesia of the left half of the tongue, the loss of sensation extending to within an inch of its base; also of the inside of the cheek, the gums, and roof of the mouth, as far back as the anterior arch of the fauces and middle of the soft palate, internally as far as the median line; there is loss of the sense of taste in that part of the tongue corresponding to the loss of sensation.

There is complete anæsthesia of the left cavities of the nose, and the sense of smell is also much impaired; there is superficial ulceration about the left corner of the mouth and left nostril, also some swelling of the left side of the nose. There is a bald patch on the top of the head on the left of the median line, looking like a cicatrix with some superficial ulceration at its edges (the hair near it is not affected by fungus). The muscles of mastication act as well on the left side as on the right, and the muscles of expression are unaffected. There is perception of shadows in left eye. The sight of the right eye is perfect.

Treatment.—Eye to be bound up with fofus belladonna; to take mixt. ferri perchlor.

Nov. 15.—The opacity on surface of cornea has nearly cleared away, evidently from superficial sloughing; there is a large abscess

in the cornea beneath and another in the iris ; there is still good perception of shadows. Eye to be bound up as before. To take *syrupi ferri iodide* ℥j., *ol. morrhuæ*, ℥ij. ; bis die. A bottle containing some lotion was brought, which was found to contain lead.

Nov. 20.—Cornea converted into a mixture of pus and slough. Iris cannot be distinguished ; conjunctiva more swollen and bluish-red. No perception of light, sensation returning in side of tongue. Excision of eyeball proposed ; patient has not attended since.

CASE III.—Blow on one eye, followed a fortnight later by sudden pain in the right forehead and proptosis—Subsequent paralysis of all the muscles of the right eyeball—Afterwards extreme proptosis of the other, with acute neuritis—Recovery.

(Case under the care of Mr. HUTCHINSON.)

The following case is worth relating, if only on account of its extreme obscurity. It seems almost impossible to give any plausible conjecture as to the cause of the disease.

Henry Rowney, æt. 16, a very intelligent lad, was admitted on March 8, 1862, as an out-patient at Moorfields. He had paralysis of all the muscles of the right eye, and the pupil was widely dilated. The eye was quite fixed in the orbit. He could see only $\frac{2}{200}$. With the ophthalmoscope nothing was discovered. He had already been to Guy's Hospital (under Mr. Bader's care), and possibly atropine had been used. His symptoms had commenced one month before, and the following was his statement respecting them :—He went to work quite well one morning. About 4 o'clock in the afternoon, he had an attack of violent pain in the right forehead. He took his tea, but threw it up again. He went home in the evening, was very giddy, had most severe headache and continued sickness. His mother "led him to a doctor's" the same evening. He now had drooping of the right eyelid. Through the night he continued sick, and next morning, according to his mother's statement, his eyeball "projected almost out of his head." A fortnight before this occurrence

he had been struck a hard blow over the right eye with the back of a boy's hand. It gave him much pain, and he could not take his supper that night. At the time of his admission, the eye had receded into the orbit, but he still had severe headaches every night and morning. He still went to work every day, his employment being that of a wood polisher. He slept well. The pain in the head was near the frontal eminence of the right side, and did not pass higher. His right ear "had a kettle boiling in it," and was very deaf. He could only hear a watch closely pressed over it; while on the left side he could hear well. Sensation was defective but not absent in the eye, upper lid, forehead, and side of nose.

It was noted, March 25th, that he could only spell No. 16 (J.) with the right with the aid of + 12. Without the glass, he could only spell 19 (J.). The disc and retinal circulation seemed quite normal. There was no trace of lymph, nor any degree of pallor to be detected. On April 1st, congestion of the conjunctiva and œdema of the left eye had appeared. On April 5th, it is noted "the paralysis of the right eye persists. The left eyeball is becoming prominent and more congested. The conjunctiva is cedematous and shows many large tortuous veins. There is some aching pain over the left brow. The pain has left the right side and gone over to the left. The left pupil is active, and the vision perfect. There is no paralysis. The central veins of the left are full and dark, but not to an extreme degree; the veins of the right are normal. The evidence of venous distension is shown in all parts of the conjunctiva of the left, ocular and palpebral. There are, however, no large veins visible passing over the edges of the orbit. The veins of the right are not distended, and the lower lids of the two contrast strongly when exerted. The left shows a distinct network of veins, very much enlarged, but the different trunks are easily distinguished."

On April 12th he was admitted into the London Hospital. He could then spell No. 2 (Sn.) at 8", but with difficulty. A fortnight later, the proptosis was extreme. There was no loss of sensation. The pupil was of normal size, and acted a little. He complained of sickness in the morning, and on three occasions vomited his breakfast. He could then only count fingers with the left. With the right and a diaphragm $\frac{2}{4}0$ with + 10 he read No. 3 (Sn.) at 10".

On April 30th, neuritis of the left optic disc, with numerous extravasations of blood, was detected. He could then sleep well. On May 12th, he had less pain and less prominence of the left eyeball. The right eyeball moved a little in all directions. A week later, the improvement was more marked. On May 26th, the left eyeball was noted to be quite moveable in the swelling behind it. He had no perception of light, the pupil being of medium size and motionless. On July 21st he could count fingers. On August 4th he was very deaf, most so on the right side, and complained much of a buzzing noise,—“all of a buzz.” He could not hear well on the left side, but had no “buzzing.” He then became an out-patient under the care of Mr. Tay.

On August 18th it was noted that the external rectus was paralysed on both sides, causing convergent strabismus. The internal rectus seemed active on both sides; the superior and inferior weak on the right side. He had no pain, and was at work again. He still had the noise in the right ear.

October 27th.—It was noted that with the right eye he could see $\frac{20}{60}$, and with + 12 No. 2 (Sn.); without a glass he could read 52 (Sn.).

November 3rd.—The noise in the right ear was reported to be greater.

January 5th, 1870.—It is noted he still continued at work as a wood polisher, and no change had occurred in his symptoms. He continued to attend till August 10th, when he ceased to do so. In May it was noted that the noise in the ear was said to be louder.

CASE IV.—*Suppurative Meningitis under the tentorium cerebelli following on Iridectomy on account of pain and increase of tension of the eyeball—Hæmorrhage within the eyeball—Suppuration of the eyeball—Abscess external to the eyeball—Death—Inflammation of the pia-mater covering the cerebellum, &c.—Granular kidneys, and general degeneration of viscera.*

By WAREN TAY, F.R.C.S.

THE interest of the following case lies in the very serious changes which resulted from the performance of a very simple operation in a patient who was advanced in life, and whose tissues were in a state of general disorganisa-

tion. It is probable that after the performance of the iridectomy the eyeball became filled with blood clot, which degenerated and was followed by suppuration. An abscess formed at the back of the orbit, and most probably, as suggested by Dr. Sutton at the autopsy, gave rise to slight meningitis at the base of the brain, and this again to the severe suppurative meningitis found beneath the tentorium cerebelli. Why the inflammatory changes should have been so well marked on the left side of the cerebellum and so slightly marked at the base of the cerebrum and around the optic foramen is at present unexplained. The question of removing the left eyeball while the tissues around were infiltrated, and it was still painful, was discussed, but it was not formally proposed to the patient, when she expressed unwillingness to have anything further done.

Margaret Edgley, æt. 68, was admitted into the London Hospital under my care, May 15th, 1871. The cornea of the left eye was "blistered," the ciliary region was dusky and the iris bulged forwards. There was some increase of tension, and the eye seemed in a condition simulating chronic glaucoma. She had had pain of a severe, but not extreme character at intervals for some months. The pupil was triangular in shape, its base being downwards and outwards. Behind the right pupil was a membrane with several openings, through which the fundus could be seen. There were evidences of considerable atrophy of the choroid. She said that she had been under the care of Mr. Bader, two years before, for cataract, and that he had operated on both eyes. "She had the cataracts at home." The vision in each eye amounted to little more than perception of large objects. She could not see her way about, as the left eye was painful and the globe appeared somewhat hard. Mr. Hutchinson, who kindly saw the case in consultation, recommended that iridectomy should be performed on the left eye in the hope of relieving the pain and possibly of restoring a certain amount of sight, and that the membrane across the right pupil should be torn with needles. A week after admission these suggestions were carried out. No special difficulty of any sort was encountered in the course of the operation.

on either eye. The iris of the left eye was easily torn ("rotten"), but enough was removed to make a fair-sized pupil, and the blood which was effused was all removed with a curette without difficulty. In the evening, some pain was complained of in the eye, but a leech being applied to the temple it passed away. The next day the left cornea was quite bright, but there was a little blood on the iris. The eye was said to be free from pain, and the right eye was quite quiet. About nine o'clock in the evening severe pain came on in the left eye. A leech was applied to the temple, and the pain was relieved for a time, but returned in the course of the night and continued. The next day the eyeball was very painful, the cornea was quite clear, but there was more blood in front of the iris, and the eyelids were much swollen. The following day the eyelids were more swollen; she had had great pain in the course of the night, but this had moderated in the course of the morning. During the next few days the pain in the eyeball had almost passed away, and the swelling of the eyelids had somewhat diminished. There was no fluctuation to be detected in the orbit. The cornea had given way, and there was a considerable amount of purulent discharge. A poultice was applied, and tonics and stimulants were given internally. She was very feeble, and had a troublesome cough, spitting up a quantity of phlegm. On the 29th, a week after the operation, she was very feverish and sweated a great deal. She had not shivered. During the next few days she seemed to improve. On June 2nd she was reported by the nurse to take her food well and to be quite cheerful. She complained of no pain, and seemed better. On June 3rd she was seen by Mr. Nettleship at 2:35 p.m. He noted her temperature to be 106° , her pulse 148, and the respirations 75 per minute. At half-past seven that morning she had had a "shivering fit," rather a bad one, but lasting only a few minutes. Since that time she had remained very ill; when seen she was semi-conscious, there was slight "subsultus," and she did not put out her tongue when asked. Her skin was moist and her face was dusky. She died the same night. The right eye had remained quite quiet.

At the *post-mortem* examination conducted by Dr. Sutton, the most important changes were found within the head, but nearly all the viscera were found more or less diseased. The kidneys were very granular, the liver was soft and fatty, the heart was

large, soft and of a pale dirty colour. The tricuspid orifice was enlarged. The lungs were congested. On removing the calvaria, &c., the arachnoid and pia-mater covering the upper and lateral parts of the hemispheres were quite healthy, and the base of the brain and the neighbourhood of the optic foramina appeared at first healthy. On incising the tentorium cerebelli, some purulent fluid at once escaped, and a quantity of pus was found in and under the pia-mater covering the under surface of the cerebellum, and it passed round to the upper surface where there was a considerable quantity of yellow pus beneath the pia-mater. Both sides of the cerebellum were covered with pus, but the larger quantity was on the left side. The third and lateral ventricles contained some blood-stained puriform fluid. The lining membrane of the ventricles was much congested, and there were many spots of extravasated blood in the membrane, and the largest number were seen in the lining membrane of the left lateral ventricle. On close inspection by Dr. Sutton and Mr. McCarthy, a little pus was noticed around the basilar artery and beneath the pia-mater covering the pons varolii, and there was rather more puro-lymph passing over the right fissure of sylvius at the base of the brain. There was no pus around the optic nerves where they issued from the orbit. Mr. Nettleship, however, kindly removed the roof of the orbit on the left side, and at first no pus was found, but, on opening the sheath of the optic nerve immediately within the orbit, a minute quantity was seen, and on tracing it backwards the amount within the sheath increased. While exposing the eyeball, a quantity of dirty-red, apparently blood-stained, pus escaped. This collection was outside the eyeball, but there was no distinct abscess-wall. There was a blood-clot within the eyeball. The tissues in the right orbit were quite natural.

CASE V.—*Wound of Eyeball in sclero-corneal region—Sympathetic Ophthalmia of the other Eye in five weeks—Enucleation of the injured Eyeball—Temporary improvement, followed by almost complete loss of sight in the Eye sympathetically affected.*

By WARREN TAY, F.R.C.S.

A young man, æt. 23, was admitted into the London Hospital during the first week of August, 1872, under my care. Whilst

at work his right eye had been struck by a piece of metal, which he stated was not of large size, but he did not think it had remained in the eye. A gaping wound was found in the sclero-corneal region, and the globe was collapsed, a quantity of vitreous and it was suspected the lens also, having escaped. He said he had no pain in the eye, and refused to have any operation performed, though it was represented to him that the eye would be of no use to him and might injure the other. In the course of a few days the eyeball filled out again without any untoward symptoms, and he could see the shadows of fingers passing in front of his eye. Cold applications had been used to the eye and atropine solution. He had had no pain. It was evident that his lens was still in place by means of the catoptric test. His sight did not improve further. He was carefully watched for a month, and then at his request was allowed to go home. He was distinctly told that he was liable to have the other eye become affected at any time, and that should this occur he should apply at once. In nine days' time he came into the ward to see the nurse, who had been kind to him, and mentioned to her that the good eye was becoming dim. She urged him very strongly to see me at once, but he was afraid to do so, and did not come till four days later, that is, a fortnight from the time that he left the hospital, and about four or five days from the commencement of the attack of sympathetic irritation. He assured me that he had no pain in the injured eye, and that he had not had any. The eye seemed quite quiet. The left eye showed decided symptoms of commencing iritis. The pupil was small and would not act; the iris was discoloured and the aqueous looked muddy. His vision was limited to the largest letters at a distance, and he could only read moderate-sized print. A solution of atropine was applied at once, and he was advised to have the injured eyeball removed. He obstinately refused at first, but after some persuasion yielded, and the operation was accordingly performed. No foreign body was detected in the orbit, and, on opening the eyeball, no trace of any recent inflammation or of any foreign body could be found within it. The eyeball was not preserved, nor was any microscopic examination made. It seemed so free from recent mischief, to the naked eye, that I overlooked the desirability of any further examination. In the first week afterwards the condition of the remaining eye

improved somewhat. The pupil dilated, leaving a ring on the anterior surface of the capsule of the lens, indicating where it had been adherent for a short time. His sight, he said, was much clearer, but, on testing, the improvement was not very marked. This improvement was but temporary: the anterior chamber became gradually deeper, and punctate deposits could be seen on the posterior lamina of the cornea, the iris sloping backwards from its ciliary margin to the pupillary edge where it was adherent to the capsule of the lens. The whole iris seemed pulled backwards, and the anterior surface of the ciliary attachment showed a ring of small protuberances either due to effusion behind it or to nodules of lymph in front. They seemed too uniform for lymph. The size of the pupil was, of course, much larger than before the use of atropine. The capsule of the lens and the lens itself became studded with a number of white dots, indicating some change going on in their structure from chronic inflammation. The fundus could not be illuminated for ophthalmoscopic examination, but with focal illumination, an indistinct mass of substance could be seen, as if either the retina were being pushed forwards or the vitreous was becoming altered. No floating bodies could be detected. His sight gradually failed, so that at the end of three months from the time of the accident his vision was limited to the perception of shadows. The anterior chamber afterwards became shallower, losing the appearance of a short funnel. He could not see his way about.

The points of interest, in the above case, seem to me, chiefly, that, in the first place, the eyeball filled out again, and it became evident that the lens had not been injured, though vitreous must have escaped; that he should gain any sight in an eye so damaged, and that the eye should remain (apparently) perfectly quiet for a month or five weeks without exciting any irritation in the other eye, and that he should then, so quickly after dismissal, have a sympathetic affection come on without the injured eye becoming inflamed or painful. The inflammation of the uninjured eye seems to have involved all its internal structures, and with the exception of a temporary check, has proceeded fairly rapidly to the almost total destruction

of vision. The condition of the lens and its capsule was one which is certainly not often seen. There was comparatively little ciliary or conjunctival congestion and an absence of pain throughout. The pupil was not occluded. The treatment consisted in the employment of atropine and the internal administration of small doses of grey and Dover's powder with quinine. Counter-irritation was applied from time to time. It is greatly to be regretted that the patient did not consent to have the eyeball removed when first advised to do so, and that he did not apply for advice as soon as ever the uninjured eye became affected. The question of the advisability of removing wounded eyeballs is generally acknowledged to be one of great anxiety in certain cases. So many eyes which have received severe injuries in the ciliary region remain quiescent, and set up no irritation, that it cannot be laid down as a rule that all eyeballs in which we do not expect useful sight to be regained should be at once removed; yet I fancy it would often be better to remove, than to try to save, in such cases. In many instances we get timely warning from a complaint of pain or from visible irritation, that it will be well to remove a damaged eyeball; but in such instances as the one above narrated, if the globe is not taken out at the time of first seeing the patient, there is no second chance afforded before it is too late. If there is any probability that a foreign body remains in the eye, the indication is clear. A possibility existed in this case, and I had no hesitation in advising excision, though the eye was quiet. There was no useful sight remaining. Cases have been recorded in which the injured eye ultimately proved useful, whilst the sight of the one secondarily affected was lost, but such a result could not have happened here. Enucleation seems to be of use only in the earliest stage of irritation. If marked sympathetic iritis be once set up there is probably not much good to be gained, a temporary check only will occur in the progress of the disease.

OBSERVATIONS ON DEFECTS OF SIGHT IN DISEASES OF THE
NERVOUS SYSTEM.

By J. HUGHLINGS JACKSON, M.D., F.R.C.P.,

*Physician to the London Hospital, Physician to the Hospital for
the Epileptic and Paralysed.*

I GIVE here a short account of some of the facts and opinions I have published within the last year or two on matters of common interest to physicians and ophthalmologists.

(1.) EPILEPTIFORM AMAUROSIS.

In this Journal, vol. VI, part 2, 1868, I speak of cases of what I have called Epileptiform Amaurosis, and which I used to call Epilepsy of the Retina. I now make further remarks thereon. Being a physician, I have studied such cases simply as members of a *class* of temporary nervous affections and not as symptoms of disease of the eye. There are also temporary affections of smell (subjective sensations of smell). The affinities of both these temporary sensations are to epilepsy. The patient, who is subject to temporary affection of sight, sometimes has it alone; at other times it is followed by a convulsion or by loss of consciousness. Similarly the patient who has a subjective sensation of smell, sometimes has it alone, whilst at other times he loses his consciousness, and may become convulsed. The temporary affection of smell or of sight in association with temporary loss of consciousness or convulsion would usually be called an *aura*; it is, I suppose, the sign of the beginning of a central nervous discharge, and sometimes, that is when the fit is abortive, the discharge stops short just after it has begun. Epileptiform amaurosis is, in short, *part of a fit*; it is the initial stage only. We see something analogous in convulsive seizures;

there are all degrees of such seizures. A patient who has convulsive seizures beginning in the hand may sometimes have twitching of the hand only; at other times a severe fit occurs which leaves him comatose and temporarily hemiplegic.

The temporary affection of sight which I call epileptiform amaurosis* is either a simple failure of vision—a mere *loss* of sight—or it is an “over function” of the visual nervous system—development of colours, sparks, &c. The former would be analogous to temporary *loss* of power to smell, the latter to subjective sensations of smell.

Neither of the two varieties of temporary defect of vision is a localising symptom, any more than is the occasional sequela, amaurosis from double optic neuritis. In the cases I see there are, as I have implied, usually *other nervous* symptoms, such as convulsive seizures, and in some of these cases we may localise. We can localise in certain cases of *partial* convulsion. For example, if there be with either variety of temporary affection of sight (or with permanent affection of it from double optic neuritis), an epileptiform seizure beginning deliberately in the *hand*, or *cheek*, or *foot*, we may localise. We may then conclude that there is disease of convolutions of the cerebral hemisphere opposite the side of the body on which the convulsion begins, and, further, that the part of the hemisphere faulty is near to the corpus striatum.

That the association of temporary defect of vision with convulsions beginning unilaterally is not a vague or chance association, is shown by the fact that the temporary defect of sight occasionally becomes permanent; optic neuritis may develop and may leave defective sight behind it.

* Of course in *strictness*, those cases in which there is a *development* of colours, sparks, &c., are not to be called *amaurotic*. For amaurosis is a negative symptom; development of colour, &c., is a positive symptom. But as each phenomenon can occur preceding epileptic or epileptiform seizures, the use of the expression “epileptiform amaurosis” is convenient.

(2.) OPTIC NEURITIS, WITH CONVULSIONS BEGINNING UNILATERALLY, DEPENDS ON DISEASE OF CONVOLUTIONS NEAR TO THE CORPUS STRIATUM.

I have very many times urged that the combination of symptoms* just mentioned—optic neuritis (with or without amaurosis), with convulsion beginning on one side—is the simplest one for joint work by ophthalmologists and physicians. Both symptoms must be studied. Whilst on the one hand it is of little use saying that the patient is amaurotic without describing the intra-ocular changes, so on the other hand it is of little use saying he has had a convulsion, or an epileptic or epileptiform seizure, unless we describe what *kind* of seizure it was; for a general convulsion, or a fit of an “epileptic character” will not help the ophthalmologist in the *localisation* of the cerebral disease which causes the optic neuritis. But a fit beginning in one hand, &c., will, I think, be, as I have said, very good evidence that the disease is of convolutions in the region of the middle cerebral artery, or, in other words, of convolutions near to the corpus striatum.

To say of a case that “the optic neuritis is complicated with *epilepsy*” is about as valuable as saying that “optic neuritis is complicated with *paralysis*.”

The tie betwixt the two symptoms (the amaurosis, and the convulsion beginning unilaterally) is, I think, as I have suggested (“Med. Times and Gazette,” April 30, 1864, and August 15, 1868), to be found in the distribution of the cerebral arteries. Similarly the tie betwixt subjective sensations of smell and temporary loss of consciousness is, I believe, that the anterior cerebral artery supplies the olfactory bulb and a vast tract of convolutions, as well as

* Strictly speaking optic neuritis is not a symptom; at any rate, it is not a symptom in the same sense as the convulsion. It is a pathological condition and is analogous, not to a convulsive seizure, but to the *changes of grey matter, on discharge of which the convulsion depends*. Again, it is not a symptom in the sense that vomiting is. It is, however, *convenient* to speak of optic neuritis as a symptom; it is the custom to do so.

part of the great commissure, the corpus callosum. Speaking very generally, symptoms are to be arranged not only according to the functional divisions of the nervous system, but sometimes according to its nutritive, at least its arterial, regions. If a patient has double optic neuritis, and also convulsions which begin in the hand or face, the disease will be found to be of convolutions in the region of the middle cerebral artery.

In the "Medical Times and Gazette," for November 23, 1872, and in succeeding numbers, I have published a series of cases of intracranial tumour, in some of which there was optic neuritis along with convulsions beginning unilaterally (face or hand). These cases will be referred to in several of the following sections by the numbers they have in that Journal.

(3.) CONSERVATION OF SIGHT IN OPTIC NEURITIS.

It has long been well known to ophthalmic surgeons that acute neuritis may exist when a patient can read the smallest type. But to many who are not ophthalmologists the statement seems to be simply nonsensical; it is not at all widely accepted. The first case of the series of intracranial tumour above referred to shows, however, in a very striking way, the value of the recognition of the fact (Case I, "Medical Times and Gazette," November 16, 1872). The patient was a blooming healthy-looking girl, 20 years of age. Although she had attacks of headache and vomiting, yet she was apparently so perfectly well in the intervals of these attacks that the diagnosis of intracranial tumour must have seemed *preposterous* to those who did not use the ophthalmoscope or who could not interpret its meaning.

Now this patient had a nervous symptom; that is, as above implied, she had acute double neuritis; but, as she could read the smallest type, and did not know that there was anything the matter with her sight, this nervous

symptom did not exist for those who do not use the ophthalmoscope by routine. Her sight failed before death. (Tumour and cyst of the right lobe of the cerebellum were found.)

For some time this patient had only three symptoms, the three so often found together, viz., headache, vomiting, and double optic neuritis. Now, at the most important stage of the case the third symptom (optic neuritis), as I have said, would not exist for those who do not use the ophthalmoscope *by routine*. Without it the diagnosis would have been in fault. It is true that from *very* severe headache and vomiting we may *guess* intracranial tumour, but who *would* ever guess it in a perfectly healthy-looking blooming girl, who was in good flesh, and occasionally apparently absolutely well. This indeed is the beau-ideal of a case to be mistaken early in its course for "disease of the liver." How often do we hear of amaurosis caused by "*bilious*" fever? To encourage such a mistake was the fact that the girl had always been subject to "bilious attacks." Another mistake would be hysteria. Neither of these mistakes could be made in such a case if the patient's optic discs were looked at. We did look at them, and from what we saw we were absolutely certain that there was intracranial disease, and we predicted tumour.

Conservation of sight with optic neuritis occurred in Cases III and IV of the series referred to. These were cases of convulsion beginning unilaterally. Such a convulsion, as I have remarked, points to disease of convolutions in the region of the middle cerebral artery. The next question is to ask the pathological *nature* of the disease. On this point the convulsion gives no information whatever; it points only to the *position* of certain changes in grey matter which render it explosive. The next question may be put thus. Are these local "explosive changes" produced by tumour or not? or, as it is popularly and vaguely expressed, Is the fit caused by *organio* or by *func-*

tional disease? If there be no optic neuritis the fit does not *in all probability* depend on tumour nor on any sort of adventitious product; certainly we cannot say there is tumour. But if there be also double optic neuritis we may conclude with confidence that the disease in the region of the middle cerebral artery is tumour. The optic neuritis points to the general *nature* of the disease; the seizure to the *position* of that disease. See now the bearing of routine ophthalmoscopical examination, whether sight be defective or not. It matters nothing for the diagnosis of the gross *nature* of the disease whether there is defect of sight or not; if there is double optic neuritis it suffices. In Case III there was double optic neuritis *without any defect* of sight along with convulsion beginning unilaterally. It is true I had no autopsy in this case, the patient getting well; but I have published cases of optic neuritis with convulsions beginning unilaterally, in which *post-mortem* gross disease has been found in the region of the middle cerebral artery. But what that case illustrates more especially is, that optic neuritis may not only exist with good vision, but that it may pass off, leaving sight unimpaired; on this I shall speak in Section 4.

(4.) RECOVERY FROM OPTIC NEURITIS.

I believe it to be not uncommon for patients to recover from optic neuritis. I do not say recover from amaurosis, for I now speak only of cases of optic neuritis in which there *is no defect of sight*. Thus in Case III, "Medical Times and Gazette," Dec. 7, 1872, the patient was attending on me for convulsive seizures, when one day, May 7, 1871, he complained of his sight. I had examined his eyes at his first visit, February 9, 1871 (the discs were then normal); but I had neglected to examine them at intervening visits, April 14 and 29, thus breaking a rule I have tried to enforce. On May 7 I made this note:—"There was nothing wrong observable about his sight,

judging from his manner, but he said he could not read for many minutes together, and that he saw badly across the road. I therefore looked at his discs, and, finding neuritis, tested his vision. When near the window he could read with each eye No. 1 of Jäger. He read slowly, and made one or two mistakes, but corrected them when they were pointed out to him. The discs were much swollen; the edges were lost. The veins were large and tortuous; there were irregular white patches and several recent hæmorrhages. How long these appearances had existed I could not tell. The discs were normal at his first visit on Feb. 9.

May 16.—He could still read No. 1 of Jäger and No. 1½ of Snellen. He read slowly, and made four mistakes in about four lines, *e.g.*, he said “space” for “spade,” which, however, he corrected himself. Still he complained of his sight. He said, “it comes over like a cloud now and then,” and that when he looked at the newspapers “it comes over like a mist.” His sight never failed altogether. He had occasionally “specks” in the left eye. There were no “colours.” He recognised the colours in the coloured types of Snellen very well. His field of vision was normal. The left optic disc was much swollen, the veins large, and knuckling over the edge of the disc. The arteries were obscured. There were very small shapeless white patches and scattered blotches of blood. The right optic disc was in about the same condition. There were no changes at the yellow spot. There was no albuminuria. He had had a slight giddy seizure.

I gave him large doses of iodide of potassium.

The discs gradually cleared up—indeed, by June 26, the appearances would have seemed normal to a careless observer, but the edge of the disc was slightly indistinct; the arteries were traceable, and the veins were not tortuous. By direct examination streaks were seen along some of the vessels. There was “silvery-looking” matter near the entrance of the vessels, in small

quantity; there was also a little streaking of the adjacent retina.

August 5, 1872.—He keeps well. The ophthalmoscopical changes to ordinary indirect examination are *nil*, and to direct examination they are no greater than those mentioned in the report of Case II, on which remarks will be made in the next Section.

At every visit the patient could read the smallest test-types. I tried him with Jäger's, Snellen's, Dixon's, and Williams's types, so that he did not read from memory.

(5.) SLIGHT CHANGES IN THE OPTIC DISCS IN CASES OF CEREBRAL DISEASE.

A case like the one mentioned in Section 4 not only shows that we may overlook a grave pathological condition of the end of one of the most important nerves in the body, unless we are in the habit of using the ophthalmoscope by routine, but it also leads us to attach extreme importance to the estimation of *very slight changes* in and about the discs. For the cases related in the last section, and other cases, convince me that very severe neuritis may leave such changes as would be entirely overlooked by anyone who did not examine the eyes with great care. The patient having no defect of sight, there would be no *impulse* to examine very carefully unless the observer were *told* that neuritis *had* existed some time before. Now suppose a patient comes to me for a nervous symptom, let us say for a one-sided convulsion, it is exceedingly important (compare Section 2) to know (that is when there is no neuritis and no atrophy after a neuritis) whether there *has been* any neuritis. Because, whether it be that there *is*, or only that there *has been*, neuritis, I should think it most likely that the convulsion depends on some tumour or other adventitious product; or, as it is usually put, that it depends on organic disease (*gross organic disease*).

I have in the concluding part of last section referred to a case I have reported, "Med. Times and Gazette," Nov. 30, there numbered Case II. In that case the patient's sight was good; he had had epileptiform seizures beginning in his left thumb.* Now we were certain that he had disease of *some kind* in the region of the left middle cerebral artery, the question was, Was there an adventitious product? The following is from the report of the case in the "Med. Times and Gazette," Nov. 10, 1872:—

"I at first thought there was no adventitious product. The optic discs by indirect examination looked normal, but on the patient's admission Mr. Kibbler found by *direct* examination that, besides white streaking along the vessels on the optic discs, there was also in one eye white matter about their convergence. These appearances were very much more marked on the right side. There was only a little streaking along the vessels on the left. I feel very much indebted to Mr. Kibbler for having drawn my attention to these appearances; for whatever they may mean, it is desirable not to overlook them. As I have seen such slight changes (see Case III, Section 4) after very severe neuritis, I believed this patient *had had* neuritis. His sight was good, and had never been affected; but this I am quite certain did not contra-indicate the diagnosis of neuritis (see remarks on Case III, in Section 4). However, such slight ophthalmoscopical appearances are so very common, that it was rash to attach so much importance to them as evidences of past neuritis; yet doing so led me to the correct diagnosis of an adventitious product. I may here most conveniently mention that the backs of the eyes, with the optic nerves, were removed, *post-mortem*, and examined microscopically, by Dr. Hermann Pagenstecher, who pronounced them to be quite normal."

So here it would appear that I was wrong in attaching

*- In this case there was found a tubercle, the size of a hazel-nut, in the hinder part of the third *right* frontal convolution. The patient died of phthisis.

importance to slight changes about the discs, but I was not wrong in saying that only very slight changes are frequently found after neuritis. We have not often any knowledge of the state of the discs before the neuritis. In Case III (see Section 4), the discs were, I considered, normal before the acute neuritis appeared, but then I did not examine the eyes by the direct method, so that I cannot say that the *slight* changes, seen after the acute neuritis had disappeared (the streaking along the vessels and the silvery matter at their convergence), were not there before the acute neuritis came on. We often, in cerebral cases (cases of epilepsy for example) find trifling changes in the eyes about the discs—white silvery streaks along the vessels, white specks on the vessels, slight obscurity of some of them just beyond the disc, and at a little distance from the disc sudden bending of the veins; this bending suggests to me the limits of a former swelling of the optic disc. But as yet the interpretation of these appearances is doubtful; they, or some of them, may be only physiological peculiarities.

(6.) STAGES OF OPTIC NEURITIS.

Since the physician sees optic neuritis in its earliest stage, and before there is any defect of sight to lead the patient to consult an ophthalmic surgeon, he has more often under his observation the whole of the different stages of neuritis. The physician will see more of those cases in which neuritis passes off leaving sight unimpaired. The ophthalmologist will most often see those cases in which the neuritis has existed for some time, and those cases of neuritis which go down to atrophy. Beginners in ophthalmology I feel certain take for *varieties* of neuritis what are different stages but of one process. If we take a marked specimen of neuritis early (especially before sight has failed) we may find the disc lost in an area about two or perhaps three times the

diameter of a normal disc. The arteries are not traceable in this area, the veins are lost here and there, and they suddenly dip at the edge and reappear beyond. The area is bespattered more or less, chiefly at its edge, with shapeless little blood-clots; there are also on the patch lustreless and shapeless white patches. This is what those will occasionally see who in cerebral disease disregard the patient's exclamation, "Oh, there is nothing the matter with my *eyes*," "I come for fits," &c. What those will often see who *wait until the patient says his sight has failed* (and sometimes it fails rapidly) is a uniform whitish swelling of the disc without many, if any, white patches or hæmorrhages; the disc is raised and slopes off into the fundus almost gradually. This is somewhat, like in appearance the "swollen disc" which occurs in some cases of tubercular meningitis not long before death. There are plenty of exceptions to these statements.

(7.) TWO CASES OF UNIOULAR NEURITIS FROM CEREBRAL TUMOUR.

Unioocular optic neuritis is exceedingly rare in *Physician's* practice. Such a case from my practice, with an examination of each eye by Dr. Hermann Pagenstecher, is reported in these Reports, November, 1871, p. 130. In that case the neuritis was of the right eye. There was hemiplegia of the right side, and there was a large gliomatous tumour in the left hemisphere. The tumour was on the side opposite the neuritis. The left sixth nerve was paralysed; the cause of the palsy of this nerve was not discovered at the autopsy. When this man came in his case looked like an ordinary one of cerebral hæmorrhage, and that was my diagnosis. But when I discovered the neuritis, and when the palsy of the sixth nerve came on, I diagnosed tumour of the left cerebral hemisphere.

This year I had another case of almost exactly the same

kind. It has been briefly mentioned in the Hospital Reports of the "Brit. Med. Jour.," July 20, 1872, p. 67. There was neuritis of the left eye, left hemiplegia, and again there was a large tumour of the cerebral hemisphere (the right one). The tumour was therefore in this case also on the side opposite the neuritis. In this second case the existence of the neuritis and the similarity of the case to the first case led me to the confident prediction of tumour of the brain. Of course there were other symptoms—hemiplegia and much mental disturbance—but without the neuritis these very symptoms would have led to the erroneous diagnosis of local softening from thrombosis.

I used to say that *uniocular* neuritis did not occur from tumour of the brain *mass*. I can only say now that unioocular neuritis very rarely occurs even when but *one* cerebral hemisphere is diseased.

(8.) OPTIC NEURITIS FROM DISEASE OF THE CEREBELLUM.

I have recently had under my care several cases of tumour in the cerebellum. I have adverted to one in Section 3 (I speak, of course, only of cases completed by autopsy). What I wish to remark now is that, so far as I can judge, there is not the least difference betwixt the optic neuritis produced by tumour of the cerebrum and that produced by tumour of the cerebellum—no difference in the ophthalmoscopical appearances I mean. In each there may be first of all no defect of sight; at a certain stage of each there comes a so-called "swollen disc;" and in each, if the patient lives long enough, the discs may lose all swelling and become flat and atrophic. In other words, and more generally, as I have many times urged, optic neuritis is *not a localising symptom*. From it, or from any stage of it, we cannot do more than infer that there is an adventitious product in some part inside the cranium, but whereabouts within the cranium that ad-

ventitious product lies has to be settled by other kinds of evidence. Optic neuritis is of no more value in localization than headache or vomiting is. If we find a reeling gait along with optic neuritis, the diagnosis of tumour of the cerebellum, or of tumour under the tentorium, is most probable.

Such a localising symptom is often not forthcoming in the *early* stages of a case of disease of the cerebellum, and in some cases it is absent throughout, as in the case mentioned in Section 3. We can then do no more than say that the adventitious product is probably either of the cerebral hemisphere or of the cerebellum. From the *position* of the headache, the great urgency of the vomiting, we cannot safely infer anything as to the position of the adventitious product. I say "adventitious product," because optic neuritis results either from tumour (syphilitic or not), or abscess, or in fact from any sort of "foreign body" in either of the great nervous masses.

(9.) NERVOUS BLINDNESS AND NERVOUS DEAFNESS IN CEREBRAL DISEASE.

From the first of my studies of amaurosis, I have been struck by the fact that blindness of nervous origin nearly always results, and deafness of nervous origin scarcely ever, I believe never, results from tumour of the cerebrum or of the cerebellum. Of course there are the exceptional cases of tumour so placed as to compress the auditory nerve itself; it is needless to say that there is deafness here. I have recorded a case of tumour of the cerebellum causing deafness in this way ("Med. Times and Gazette," June 17, 1865).

And of course, too, cases of deafness from organic disease of the ear with abscess in the cerebrum or cerebellum, have no bearing on the question; it is not the cerebral or cerebellar disease which causes the deafness in these cases;

it is the ear disease which causes the cerebral or cerebellar disease.

I have, however, seen two cases of intra-cranial disease in each of which there was deafness of both ears. In a case published in this Journal, Vol. iv, Pt. iv, p. 420, there was blindness and double and complete deafness along with tumour of the left cerebral hemisphere. But there was *also* a tumour the size of a hazel nut at the point of junction of the pons and medulla oblongata of the left side. Its very exact point of attachment could not be ascertained. Why, however, there was deafness of *both* sides I do not know. In this Journal, Vol. v, Pt. iv, I published a case (there numbered XXI) of a woman who was blind and deaf.*

Although in this case I was right in predicting an intra-cranial tumour—a very easy thing in such a case—I was wrong on two matters. I said (*op. cit.* p. 281):—

“I think the disease must be chiefly of the left cerebral hemisphere, and probably of its anterior lobe; but I equally think there must be disease lower down, and away from the cerebral hemisphere to produce the deafness—for, so far as I know, deafness to any considerable extent [I now say to no obvious extent] does not occur from disease of the cerebral hemisphere.” This woman died about five years after these remarks were written, under the care of Dr. Claye Shaw, in the Metropolitan Asylum, Leavesden. He was so kind as to show me the tumour. It did not, as I had supposed, actually involve the cerebral hemisphere, but it grew from the floor of the sphenoidal fossa, and thus must have interfered with the

* Apart from my present object, this case is interesting as showing how long a patient may live after the first appearance of symptoms of intra-cranial tumour. She was first under Mr. Hulke's care in 1865, when she had optic neuritis, and at that time staggering gait. The case shows also the difficulty one has in keeping patients under observation. After being under the care of an ophthalmic surgeon, she was next under the care of a general physician (myself), and lastly, having become insane, she died under the care of an alienist physician, in the summer of 1872.

hemisphere by pressure at least; moreover the disease was on the *right* side. The only reason I had for thinking it to be on the left was that I had been told that the girl had had a *right*-side seizure, doubtfully epileptiform. No doubt it had really been on the left. But the point of importance for my present subject is as to the deafness. There was but one tumour; not two as I had imagined. But *in effect* there were two lesions, as the tumour extended so far back as the seventh pair of nerves. There was affection of the hemisphere (the patient *had become insane*) by the tumour, and the auditory nerve was *reached by it*. But it must be remarked that Dr. Claye Shaw found no palsy of the parts supplied by the portio-dura, which nerve also must have been in the way of pressure.

Whatever the explanation may be, the fact that blindness often, and deafness scarcely ever—never, I think—depends on disease limited to the cerebral hemisphere or to the cerebellum is very significant.

CURATOR'S PATHOLOGICAL REPORT.

By EDWARD NETTLESHIP, F.R.C.S.,

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THIS Report is a continuation of those previously made, and includes nearly all the eyes removed at Moorfields between the date of the last Report and November, 1872, together with a good many which had been omitted from my earlier Reports.

In many cases the eyes lost by injury have no great pathological interest, and it seemed better therefore to condense the account of these specimens by recording their chief points in a tabular form ; all the other specimens are described separately in more or less detail.

I intended to place at the end of the present account a short abstract of the most important observations recorded in this and the two preceding Reports. I found however that I should not be able to do this in time for the present number. I hope to append it to a future contribution.

The two following tables contain a short account of the eyes lost by the direct or indirect results of injuries. The *1st Table* contains a description of those in which foreign bodies were found ; in the *2nd Table* are placed the eyes removed on account of perforating wounds, but in which no foreign body was found, and eyes ruptured by blows, &c. ; while all cases of injury not coming under the above headings have been made into a *3rd Table*.

TABLE I.—EYES CONTAINING A FOREIGN BODY.

Name, Age, Date of Excision, Register No., &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Man. Oct. 25th, 1872. No. 258. Couper.	Right eye wound- ed by chip of iron.	4 days.	Seen twenty-four hours after accident, and examined ophthalmoscopically by Dr. Buller. Wound at lower part of cornea, iris, and peripheral part of lens, passing towards a dark movable body in lower part of vitreous. Patch of blood in or on retina, below (erect image) O.D. Great pain and chemosis fol- lowed. Lens became opalescent. At time of excision there was still percep- tion of light.	<i>Foreign body</i> (chip of steel size of half a lentil) found in a small cavity in upper part of vitreous just in front of ora serrata, and in contact with ciliary retina. A large clot of dark blood in lower part of vitreous, and a tolerably circumscribed collection of liquid pus in centre of vitreous communicating with the blood-clot. No blood patch in retina, or on it. <i>Retina in situ</i> ; blotched over with lines and patches of white opacity, probably pus; otherwise trans- parent (examined quite fresh).
Walter G., 14. No. 117. Dec. 4, 1871. O Right eye. N Hutchinson.	Lacerated wound of cornea, iris, and lens by a piece of metal.	1 week.	Nothing known as to what became of metal.	The <i>foreign body</i> (piece of brass as large as a wheat grain) found in a large clot of blood in <i>vitreous</i> rather behind ciliary region; covered by soft greenish substance, but clean when rubbed. Many other large clots in vitreous. The borders of all the clots whitish, and passing insensibly into vitreous. No inflammatory products found microscopically, only altered blood. <i>Retina</i> <i>in situ</i> , transparent, and apparently normal.

TABLE I.—EYES CONTAINING A FOREIGN BODY (*continued*).

Name, Age, Date of Excision, Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Richard R., 22. Sept. 17, 1872. No. 242. Couper.	Right eye wound- ed by bit of cold steel.	1 month.	Seen immediately after accident. A. C. was full of blood, and there was a wound at inner side of cornea and iris. Afterwards the lens became swollen and opaque. At time of excision there was doubtful perception of light and the A. C. was shallow, but no increase of T. There was never much pain.	<i>Foreign body</i> found in midst of brick-red old blood-clot in contact with retina. The <i>retina</i> was not detached, and it as well as <i>choroid</i> appeared healthy to naked eye; <i>choroid</i> examined microscopically showed no changes.
Fredk. W., 23. May 1, 1872. No. 184. Left eye. Hulke.	Left eye wounded by a chip of iron.	5 weeks.	The doctor who attended him after accident said lens was wounded. Eye painful for several days after accident not subsequently. Had perception for two or three weeks after accident, At time of excision pupil blocked by a vascular pinkish growth of lymph from iris. Scar of wound extending from edge of cornea a short distance into sclerotic.	<i>Retina</i> detached from optic disc and choroid everywhere, and much thickened and shrunken. The small <i>vitreous</i> chamber full of soft puriform lymph, continued forwards to the mass in the pupil. A <i>piece of iron</i> was imbedded in it at lower and inner part; sharp-edged, flat, and about $\frac{3}{8}$ inch (3.12 mm.) square. <i>Lens</i> absent. <i>Subretinal space</i> filled by liquid blood. <i>Choroid</i> at part corresponding to foreign body thickened and covered by white lymph.
James D., 32. May 18, 1872. No. 196. Left eye. Hulke.	Left eye wounded by chip of iron size of a pea.	6 weeks.	Doubtful whether foreign body remained in or not. All sight lost immediately after accident. Not much pain in injured eye, but other eye, became intolerant of light and remained so till after excision. T. of left —; eye somewhat shrunken. Horizontal scar across whole width of	<i>Lens</i> absent. <i>Retina</i> detached in umbrella form. A <i>flat piece of iron</i> as large as good-sized pea imbedded in soft opaque inflammatory substance within the shrunken retina. Subretinal space full of fluid blood.

Alfred F., 36. No. 81. August 28, 1871. Right eye. Streatfeild.	2 months. A piece of stone was taken out of right eye after the accident, and he believed that nothing was left in the eye. It continued painful and red from the accident until nearly the date of excision. Scar at lower and outer part of cornea; anterior synechia. No perception. No congestion or tenderness of eye on pressure. Pupil small, excluded. Lens opaque. Left eye normal.	<i>Lens</i> absent; its capsule thickened, opaque, and the two layers united into one. <i>Foreign body</i> , a flatish, rough, black chip, about $\frac{1}{32}$ inch (2.08 mm.) square, probably iron, possibly stone, encapsuled firmly in white tissue at upper and inner part. It lay upon the ciliary processes, between them and margin of lens capsule, and had no doubt penetrated the lens from side to side. <i>Iris</i> adherent in part to lens capsule in part to scar. <i>Ciliary body</i> somewhat thickened near to foreign body. <i>Vitreous</i> fluid and stringy at lower part, elsewhere normal. <i>Retina</i> and <i>choroid</i> normal to naked eye. No microscopical examination of any part.
Wm. P., 60. May 21, 1871. No. 199. Right eye. Bowman.	7 months. Right eye wounded by small chip of iron.	<i>Chip of bright iron</i> rather firmly glued to ciliary body, close to ora serrata at lowest part of eye. <i>Lens</i> looked normal but had a patch of whitish, cheesy-looking matter on upper part of its posterior surface, probably old inflammatory matter marking track of foreign body close to lens. <i>Vitreous</i> became gelatinized in Müller's fluid from albuminous infiltration. <i>Retina</i> and <i>choroid</i> healthy to naked eye.

TABLE I.—EYES CONTAINING A FOREIGN BODY (*continued*).

Name, Age, Date of Excision. Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Wm. A., 28. May 6, 1872. Left eye. Hutchinson.	Left eye cut by a chip of steel.	8 years.	The eye gradually failed for six years after accident, when sight was entirely lost. Very little pain in it till ten months before excision, but during that period had occasional attacks of pain. First noticed white opacity in pupil ("cataract") four months before ex- cision. No perception. Right eye had muscae for five weeks before removal of L. but V. was per- fect.	<i>Foreign body</i> , a chip of iron as large as a lentil, encapsuled on <i>outer surface of scler- otic</i> at outer and lower part of equator. No scar visible anywhere on inner or outer surface of eye. Corresponding to the foreign body, but within the eye, a thick band of scar tissue between choroid and retina passing forwards and ending in a patch of exposed sclerotic near ora serrata, between inferior and external recti; this patch of bare sclerotic no doubt marks seat of entrance of foreign body, which must have passed straight backwards and cut its way out again. It is remarkable that there was <i>no puckering whatever of the sclerotic</i> . Other lines of white scar tissue passed in various directions between choroid and retina, some of them ending in little pig- mented masses consisting of old blood; these pigmented masses contained no metal. <i>Retina in situ</i> , hazy, and containing lines of old blood near the track of the foreign body. <i>Vitreous</i> fluid and nearly colour- less. <i>Lens</i> soft and milky white. <i>Pupil</i> excluded.

Thomas S., 39. July 22, 1872. No. 219. Right eye. Hutchinson.	14 years.	At time of excision R. eye was painful, and L. irritable.	No appearance of wound in sclerotic. <i>Cornea</i> has a wide, nearly round opacity at upper and inner part, resembling a healed ulcer. Area of pupil white. <i>Vitreous</i> too soft (examined in fresh state). <i>Retina</i> and <i>choroid in situ</i> . A small dark-coloured <i>foreign body</i> , size of large pin's head, just behind ora serrata at temporal side and rather below horizontal meridian; not covered by retina or choroid; its base sur- rounded by a narrow zone of pale choroid.
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TABLE II.—EYES WOUNDED OR RUPTURED, BUT NOT CONTAINING A FOREIGN BODY.

Robert R., 46. Oct. 20, 1871. No. 102. Bowman.	Eye wounded by a shot-corn fired from about 80 yards' distance.	6 days.	Notes by Mr. Rogers at date of excision. "Wound at upper and inner edge of cornea through iris and lens. Lens- substance in corneal wound. No A. C. T-1. Perception of light feeble, field central."	The shot could not be found in the eye. After careful search a small slit-shaped hole was found in outer surface of sclerotic just at situation of yellow spot. Corresponding to this was a quantity of blood in vitreous, which adhered to retina and choroid; after hardening in alcohol, blood was picked away and a ragged hole in retina and choroid found beneath; this aperture was (after allowing for accidental tearing in removing the blood) considerably larger than that in sclerotic, through which only about No. 6 eye-probe would pass.
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TABLE II.—EYES WOUNDED OR RUPTURED (*continued*).

Name, Age, Date of Excision. Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
James T., July 27, 1872. No. 222. Hulke.	R. eye injured by a piece of steel.	9 days.	Notes by Dr. Buller. "The bit of steel was supposed to be in the eye at time of excision. Wound near lower margin of cornea and iris, the latter being wounded at its ciliary attachment."	Foreign body could not be found, but besides the corneal wound, a slit-shaped aperture through all the coats of the eye, about $\frac{1}{16}$ inch (2.5 mm.) long, existed a short distance below the O. D. Vitreous contained blood and white opacities, probably pus. <i>Retina in situ</i> and transparent (examined immediately after excision). Lens normal.
Geo. T., 5. March 25, 1872. No. 164. Hutchinson.	L. eye wounded by a pair of scissors thrown at him by his mother while in a passion.	3 months.	Seen two weeks after accident by Dr. Morris Tonge, of Harrow. Then had a wound through lower and outer part of cornea, with prolapse of iris, but no inflammation. Could then read large print. Gradually a yellowish reflex appeared at back of lens, and increased. Had occasional congestion of eye, but no pain or decided inflammatory symptoms. At date of excision, L. eye congested in ciliary region, T. much diminished, a yellowish reflex from fundus, lens transparent, no A. C., anterior synechia, scar on cornea.	After chromic acid one month, the eye was examined. <i>Retina</i> detached in the usual way, but at hyaloid fossa puckered up into folds like the mouth of a bag drawn together by a running string. A considerable vitreous chamber still present and containing transparent fluid with flocculi in it. Subretinal space filled by rather firm, gelatinous material. <i>Lens</i> and <i>iris</i> in contact with cornea. O. D. much swollen.

Thos. F., 35. L. Feb. 2, 1872. No. 140. Couper.	L. eye wounded by a butcher's knife.	4 months.	Sight lost completely immediately after accident. Did not have much pain afterwards. At date of excision, L. eye T. —; somewhat shrunken; iris same colour as in other eye; slight general scleral congestion; nearly vertical scar, extending quite across cornea, and for $\frac{1}{16}$ inch (2.5 mm.) into sclerotic, above and below; no A. C.; doubtful perception. Right eye normal.	<i>Lens</i> absent. <i>Vitreous</i> considerably diminished, opaque, tough, concentrically laminated, con- sisting of closely felted finely-beaded fibres. <i>Vitreous</i> at posterior half of eye detached from retina, and its place taken by blood- clot altered into soft, spongy, greyish, albu- minous, or fibrinous mass. <i>Retina</i> detached almost everywhere, except from O. D. and ora serrata; subretinal space contained partly decolourised blood, of consistence like that in sub-hyaloid space; immediately on outer surface of retina a thin layer, in which were a great many large round inflammatory corpuscles. <i>Optic nerve</i> wasted both in and outside the eye.
Alfred T., 13. Feb. 16, 1872. No. 149. Couper.	R. eye wounded by a packing needle.	4 months.	For two days after accident could see large objects, but after that all sight was lost. Much pain followed, and he was confined to bed by it twelve weeks. Pain was in eye, side of nose, and all over head. A short time before ex- cision of R. the other eye became in- tolerant of light, and ached; recovered a day or two after operation. At time of excision—R. eye: Cornea pitted, and universally hazy, more so at lower part; iris grey-blue, with several blood-spots on its surface.	Eye much shrunken and puckered; no scar found on careful examination in recent state. Chronic acid three months. <i>Retina</i> de- tached, and shrunken into solid mass; <i>sub- retinal space</i> full of coagulated substance. <i>Sclerotic</i> and <i>cornea</i> considerably thickened. <i>Lens</i> in contact with cornea, and rendered too convex.
Priscilla H., 15. Jan. 2, 1872. No. 129. Couper.	L. eye wounded at Stowmarket gun-cotton ex- plosion.	4½ months.	At time of excision—L. eye: No percep- tion; A. C. full of blood; pupil wide; several small corneal opacities, but no large scar.	Eye shrunken and squared. Large scar at upper and outer part of sclerotic, near in- sertions of recti. No foreign body found. <i>Lens</i> transparent but displaced upwards towards wound, and made too convex appa- rently by pressure against coats of eye near wound. <i>Retina</i> detached in umbrella form, but much thickened and distorted. <i>Sub- retinal</i> fluid clear and reddish.

TABLE II.—EYES WOUNDED OR RUPTURED (*continued*).

Name, Age, Date of Excision, Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Eliza H., 37. April 15, 1872. No. 172. Hutchinson.	L. eye lacerated by glass.	7 months.	Seen almost directly after accident and excision advised, but deferred at patient's wish. Seven months later she came again because she thought R. eye had lately got rather "weak." L. was at this time a good deal shrunken and showed a large scar at lower and outer part; no perception; not painful.	Examined fresh. Umbrella detachment of <i>retina</i> up to ora serrata; <i>subretinal space</i> full of bloody fluid. <i>Lens</i> semi-opaque, its anterior capsule streaked with radiating opacities. Very numerous minute elevations on inner surface of <i>choroid</i> , so-called "colloid" bodies; all very small and covered by epithelium of choroid; they formed a broad, closely packed belt at equator, and were fewer in number elsewhere. Scar on sclerotic $\frac{1}{4}$ inch (12.5 mm.) long, about $\frac{1}{8}$ inch (3.12 mm.) behind sclero-corneal junction. No A. C. <i>Cornea</i> clear. No microscopical examination.
Chas. H., 14. Aug. 1, 1872. No. 224. Streatfeild.	L. eye wounded by a piece of wire. The wire came out again.	18 months.	The eye was painful for a fortnight after accident, and then remained quiet till three weeks before excision, when it became somewhat "watery" and irritable, but not definitely inflamed. Says he had no sight with it after accident. At date of excision, L. eye was much shrunken, and the cornea showed a long vertical opacity with anterior synechia. Small occluded pupil. Iris blue. Cornea crossed horizontally, rather below centre, by a broad band of dull opacity slightly raised above surface.	Eye squared. Müller's fluid six weeks. <i>Retina</i> detached in usual way, and much shrunken; it adhered to a spot about midway between O. D. and ciliary body at outer side, and on examination this proved to be scar of wound in sclerotic, close to anterior border of insertion of inferior oblique. Edges of sclerotic as usual turned in. No foreign body. <i>Subretinal space</i> full of the coagulated, opalescent, albuminous material so common in this situation and in the vitreous when highly infiltrated with albumen; this substance is always soft, gelatinous, and brittle, with a slightly granular surface, and reminds one, when broken, of apple-jelly.

Eye shrunken, puckered, soft in front, firm behind. *Cornea* clear, small; a scar at lower margin. *Lens* absent. *Retina* detached; separated from choroid behind by a thick mass of *bone* which did not pass forwards to front of eye.

Globe elongated by general ciliary bulging; it transmitted light well. The tendons of the muscles unusually wide and thick. From cornea to Y. S. 1.2 in. (30 mm.); vertical diameter at equator, 1.1 in. (27.5 mm.); horizontal diameter at equator, 1.06 in. (26.5 mm.). Chronic acid six months, at the end of which time sclerotic was not well hardened. Posterior part of *vitreous* fluid and clear, anterior part stringy and opaque. *Choroid* and *retina in situ*; both looked thin, but not otherwise altered. O. D. very deeply cupped, its edge however only overhanging at one part, and there only slightly; its nerve-fibres seem to be not entirely atrophied. *Lens* a concave disc, its opaque margin thicker than semi-transparent centre. Lower part of its edge very firmly adherent by tough tissue to one or two of the ciliary processes, but no scar could be found on outside of corresponding sclerotic, nor any foreign body in the tough fibrous tissue mentioned. Pupil wide and irregular from posterior synechia.

A medical man who saw him just after accident said there was no glass in the eye. All sight was lost immediately, and the eye never gave any further trouble. Was quite quiet and painless at time of excision.

Excision done on account of neuritis of R., with great swelling of O. D. This was supposed at the time to be sympathetic, but symptoms which came on afterwards led to the diagnosis of intra-cranial tumour. When last heard of, the patient had been "in a state of stupor" for many weeks.

Sight was much and permanently damaged by the prick. Since then had frequent attacks of pain in the injured eye, and intolerance of light by both. 5—6 weeks before excision L. became much inflamed and painful. At time of excision, L. cornea showed patchy haziness and some small superficial vessels running towards centre. Pupil very large and irregular; its area occupied by streaky opacities, as if after needle operations. Conjunctiva cedematous and red. He was aware of the eye having been enlarged, "projecting," only since recent inflammation.

Charles C., 21. June 30, 1871. No. 52.	L. eye wounded by glass.	16 years.	A medical man who saw him just after accident said there was no glass in the eye. All sight was lost immediately, and the eye never gave any further trouble. Was quite quiet and painless at time of excision.
Elisha W., 19. April 20, 1872. No. 176. Wordsworth	L. eye pricked by a thorn. Fresh attack of inflammation.	12 years. 6 weeks.	Sight was much and permanently damaged by the prick. Since then had frequent attacks of pain in the injured eye, and intolerance of light by both. 5—6 weeks before excision L. became much inflamed and painful. At time of excision, L. cornea showed patchy haziness and some small superficial vessels running towards centre. Pupil very large and irregular; its area occupied by streaky opacities, as if after needle operations. Conjunctiva cedematous and red. He was aware of the eye having been enlarged, "projecting," only since recent inflammation.

TABLE II.—EYES WOUNDED OR RUPTURED (continued).

Name, Age, Date of Excision. Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Thos. M., 39. Feb. 9, 1872. No. 144. Couper.	R. eye wounded by a sharp spike, which passed through lower lid.	20 years.	Three weeks after accident an operation was done on the eye which patient thought gave him some sight for a few weeks. Sight then failed completely. Eye occasionally painful since that time, and for a few weeks before excision it was especially so. Ten days before excision inflammatory oedema of the lids of <i>both eyes</i> set in; it is doubtful whether the attack began with inflammation of R. eye. A scar present at edge of right lower lid. L. eye often became dim when R. was in pain.	Eye considerably shrunken. A scar $\frac{3}{8}$ inch (12.5 mm.) long, and much puckered, behind insertion of inferior rectus. <i>Cornea</i> opaque near scar. <i>Iris</i> greenish, dragged towards scar, and showing a small hole at one part. <i>Lens</i> calcified, shrivelled, and adherent by one side to scar. Old <i>cyclitis</i> and equatorial <i>choroiditis</i> , evidenced by tough fibrous tissue on ciliary body which sent back some white bands to inner surface of retina, and by numerous spots of heaped-up pigment at equator of choroid, most numerous in lower and outer part. <i>Retina in situ</i> , looked too thin, its inner surface covered by minute elevations. <i>Vitreous</i> fluid and clear. <i>Iris</i> free, except at scar. <i>Sclerotic</i> somewhat too thick. Chronic acid 2 weeks.
Henry H., 55. Oct. 28, 1872. No. 260. Hutchinson.	L. eye lost gradually after perforating wound of upper lid and orbital tissues by large piece of gun-barrel. The piece of barrel was pulled out.	45 years.	Sight failed gradually, and was entirely lost about fifteen years after accident. A few weeks after accident was told by his medical attendant that there was a cataract which might be couched. Eye never painful until R. eye lately became affected with corneal ulcer. At date of excision, L. cornea vascular and opalescent but of normal size.	Examined fresh. Eye slightly shrunken. <i>Vitreous</i> clear; fluid behind; apparently normal in front. <i>Lens</i> for most part of chalky whiteness, but superficial layers clear; displaced upwards towards scar in <i>sclerotic</i> . <i>Retina</i> transparent and <i>in situ</i> . <i>Choroid</i> abundantly sprinkled with pigment accumulations, signs of past inflammation; many of them probably in retina. At upper part, in front of equator, a very large patch completely atrophied and showing sclerotic through; the latter on section proving to be a good deal thickened at that spot, and to a less degree everywhere else. This spot of

in sclerotic, and no wound marked the seat of a perforating wound. The *choroidal pigment* is in small dots and lines of perfectly black colour; the small dots are often more or less confluent, but never to the extent of forming large uniform black patches. The pigment deposits are almost uniformly distributed all over the choroid, and there is a black spot at the *macula lutea*. The choroidal stroma between the pigment spots is considerably atrophied. This specimen is very interesting, proving as it does the occurrence of non-suppurative choroiditis and secondary retinitis pigmentosa as the result of injury. No microscopical examination.

Eye rather shrunken. Opened at once. *Lens* absent. A layer of old white tough tissue on back of *iris* near pupillary border, passing near scar of wound into a lump of slightly vascular soft tissue as large as a hemp-seed and occupying position of lens. This lump gave off a semi-opaque thread into vitreous, which reached to equator and lay midway between the axis of the eye and the retina and consisted of branched and round corpuscles, awl-shaped blood-crystals (? hæmatoidin), and granular matter. The other structures looked healthy, except vitreous which, though of normal consistence, was slightly yellow. Recent inflammation of an old scar produced in this case tissue probably like that of a granulation with new vessels; some of the inflammatory tissue spread into the centre of the vitreous, which at the same time became stained by slight hæmorrhages from the vessels of the inflammatory tissue in front. This case illustrates remarkably well the manner in which inflammation of the vitreous depends for its existence on inflammation of some of the parts around it.

Elizabeth
T., 8.
April 30,
1872.
No. 183.
Bowman.

R. eye wounded
by a fork.

Unknown.

At date of excision, notes on her letter,
"R. eye, traumatic cataract. T. +,
pain on pressure." Scar near edge of
cornea, anterior synechia, pupil slit-
shaped and displaced towards scar.
Iris blue.

TABLE II.—EYES WOUNDED OR RUPTURED (*continued*).

Name, Age, Date of Excision. Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
A boy, 14. Jan. 29, 1872. No. 139. Streatfield.	Eye shot by an arrow from a bow.	About 10 days.	At time of excision, a jaggy contused wound with swollen edges in ciliary region, partly scleral partly corneal. Wound filled with puro-lymph.	Uniform suppuration of <i>vitreous</i> , the mass of pus into which it was converted already beginning to degenerate, as shown by the characters of many of the corpuscles. Sup- purative inflammation of <i>retina</i> and uveal tract, most advanced in front and gradually diminishing behind; <i>choroid</i> apparently normal near O. D.; <i>retina</i> everywhere enormously thickened, recognizable behind but in front blended with the purulent <i>vitreous</i> . Plug of lymph in wound con- tinuous with <i>vitreous</i> . Lens apparently normal. <i>Retina</i> slightly separated from choroid behind by tough fibrinous matter in which were a few pus corpuscles. Slight thickening of anterior part of <i>sclerotic</i> . Müller's fluid one month. The period (ten days) given as having elapsed between accident and excision is probably somewhat too short, considering the ad- vanced state of suppurative inflammation found in all parts of the eye.

Sydney P., 14. Nov. 16, 1871. No. 110. Hutchinson.	R. eye wounded by a piece of tobacco-pipe which rebound- ed from a cross- bow that he was firing.	11 days. Sight lost immediately after accident. Treated for ten days with belladonna fomentation. Had occasional pain, but not severe. At time of excision, V. barely shadows; T. n., globe very tender. A large curved wound of cornea containing prolapsed iris. Iris greenish.	Many large blood-clots in vitreous; vitreous itself normal, except yellowish tint; no in- flammatory products visible under micro- scope. <i>Lens</i> absent. <i>Retina</i> for the most part <i>in situ</i>; about $\frac{1}{16}$ inch (2.5 mm.) to inner side of O. D. a small rent through its structure filled with blood-clot, both retina and blood-clot at this spot being firmly adherent to choroid beneath; the <i>choroid itself not perforated</i>. No doubt this retina by the bit of tobacco-pipe. At Y. S. there was also a large rent in retina; its edges here were curled inwards towards vitreous, not adherent to choroid or to blood-clot, and it was probably made in opening the eye. Some thin patches of blood between retina and choroid in various parts. Examined fresh.
Samuel G., 22. April 2, 1872. No. 168. Couper.	L. eye shot by a piece of wood discharged from a catapult.	12 years. Eye was painful for about a year after accident, and after that remained quiet for several years. During the last few years again became sometimes painful, and lately the other (R.) eye has been sometimes dim. At time of excision, L. eye shrunken, soft, tender, a vertical scar in cornea.	Examined fresh. <i>Retina</i> detached and shrunken, attached at O. D., and adherent in front to back of lens and to much inflam- matory tissue present on back of ciliary body. <i>Vitreous</i> chamber practically oblit- erated, but opposite surfaces of retina not in the least coherent. <i>Choroid</i> at equator studded somewhat abundantly by little white soft pedunculated bodies, which were easily detached; not examined with micro- scope; none except at equator. <i>Lens</i> shrunken to a mere remnant. <i>Subretinal</i> <i>space</i> contained a great deal of cholesterine floating in fluid.

TABLE II.—EYES WOUNDED OR RUPTURED (*continued*).

Name, Age, Date of Excision. Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Wm. M., 24. April 8, 1872. No. 170. Streatfeild.	R. eye wounded by large piece of red-hot steel.	7½ weeks.	Says that immediately after accident he could only see shadows, and asserts that he could still see as much at date of excision. For a few days after accident had pain in injured eye, but it then became quiet. About three weeks after injury a piece of prolapsed iris cut off by Mr. Streatfeild. Three or four days before excision of R. the L. eye became inflamed, painful, and misty, and at latter date there was sympathetic iritis, with steamy cornea, and much congestion, but the eye was not tender.	Examined fresh. Scar in cornea and sclerotic at upper part. Eye slightly shrunken and squared. <i>Lens</i> absent; its place taken by a plug of lymph, which adhered to corneal scar. <i>Vitreous</i> clear. <i>Retina</i> slightly detached in numerous folds, but still very transparent (probably the slight opalescence which was present was the result of post-mortem change, the eye having been kept forty-eight hours). <i>V. S.</i> looked normal, and was of healthy colour. Great thickening of <i>choroid</i> at back and outer part of eye, including parts around O. D. and at Y. S., while at outer side of eye a thin layer of blood-clot lay between the sclerotic and thickened choroid. The inner surface of the thickened and detached choroid slightly wrinkled. Choroidal epithelium normal everywhere. No microscopical examination.
Wm. P., 47. Oct. 3, 1871. No. 96. Lawson.	R. eye injured (probably wounded) by a piece of blunt red-hot iron, as large as a finger.	3 weeks.	At time of excision a large transverse scar on cornea, with prolapse of iris.	No record.
Thos. V., 21. Aug. 12, 1871. No. 73. Hulke.	L. eye burst by a blow.	4 days.	Seen four days after accident. Much chemosis; blood in A. C. No perception.	Ruptured at outer side of globe. Eye full of blood. <i>Lens</i> absent. <i>Retina</i> detached, broken up, and mixed with blood.

TABLE III.—EYES LOST BY BLOWS, SCRATCHES, &c.

James K., 52. May 11, 1872. No. 191. Bowman.	R. eye struck by a stick.	8 days.	Vision was lost directly after the blow; it was good before. Rupture of sclerotic apparently near corneal edge, and occupying the upper semi-circumference. Recent bulging scar at seat of rupture.	Chronic acid five months. Sclerotic very hard. On careful examination, the seat of rupture was found to be the sclero-corneal junction just in front of ciliary processes. No trace of lens, its capsule, or the iris. <i>Vitreous</i> opaque (from albuminous infiltration) but of normal consistence, and containing two large clots of blood. Moderate, uniform thickening of <i>retina</i> , with a few slight inward duplications, the whole membrane being separated from choroid by a nearly uniform layer of fluid, about $\frac{1}{16}$ inch (1 mm.) in thickness. All these appearances doubtless due to oedema. No naked eye change in <i>choroid</i> . No microscopical examination.
Hannah B., 57. May 14, 1872. No. 195. Critchett.	L. eye struck severely by a chair.	3 months.	Both eyes were before much damaged; they inflamed at æt. 14, and the sight had been bad ever since. Probably L. was glaucomatous at time of accident, for she could see only to temporal side with it, and at time of its excision R. was glaucomatous, and iridectomy was done.	Eye much shrunken and puckered; O. N. wasted; <i>cornea</i> prominent, vascular, semi-opaque. Rupture at or close behind sclero-corneal junction. Lips of wound separated by $\frac{1}{16}$ inch (2.5 mm.); both edges turned inwards. <i>Cornea</i> thickened everywhere, more so near wound. <i>Retina</i> absent, except a small button at O. D.; it had been torn off and escaped with the vitreous. Yellow, clear fluid in subretinal space. No <i>lens</i> . A layer $\frac{1}{8}$ inch thick (3.12 mm.) of tough pinkish tissue (no doubt organised blood-clot) between choroid and retina, on side opposite to rupture; the bleeding would be more likely to occur there than near wound, on account of the dragging produced by the escaping vitreous and retina.

TABLE III.—EYES LOST BY BLOWS, SCRATCHES, &c. (*continued*).

Name, Age, Date of Excision. Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since acci- dent and at time of Excision. State of other Eye.	Changes found in Excised Eye.
John B., 19. March 17, 1872. No. 161. Streatfield.	L. eye struck by a fist.	3 months.	The eye was "blackened" (ecchy- mosis of lids), and he could never see more than shadows after the blow. Could still see shadows at date of excision. There had been no pain lately, and the other eye was normal.	Size and shape of eye normal, except cornea, which was opaque and staphylomatous. Müller's fluid two months. The <i>sclerotic</i> did not harden well. The <i>vitreous</i> and <i>retina</i> were both in an early stage of suppurative inflammation, and much recent lymph covered inner surface of <i>ciliary body</i>. In the <i>retina</i> the principal changes were—1st, the existence of numerous little foldings, which projected into the vitreous, and were due, partly no doubt to an increase in the area of the retina by inflammatory oedema; 2nd, numerous minute circumscribed collections of pus corpuscles in the nerve-fibre layer, many of which had perforated the internal limiting membrane, and projected inwards against the hyaloid. The <i>hyaloid</i> itself at the posterior half of eye separated with great ease from retina, and its outer surface was thickly spotted and streaked with little sand-like dots and lines of opacity, all consisting of well-formed pus-corpuscles. The pus was gathered into round masses, which were often collected together close to the larger retinal vessels, and thus produced the appearance of opaque lines on the hyaloid, having the same arrangement as the vessels. The observation is interesting, as pointing to the retinal vessels as the

source of the pus at the back of the vitreous in this and similar cases. *Choroid* looked normal to naked eye, except that it was slightly detached from sclerotic in front of equator. *Lens* rather shrunken equatorially, and so a little too convex. *Cornea* thickened, except at one part, where is a scar of a perforating ulcer thinly healed over, and containing iris prolapsed into it.

Large staphyloma just behind insertion of superior and inferior recti. *Sclerotic* and *choroid* uniformly thinned at staphylomatous parts; corresponding part of *retina* slightly separated in little patches from choroid. *Vitreous* normal, but hyaloid unusually adherent to retina at ora serrata, and for a short distance behind it; this adhesion was perhaps the cause of the slight retinal separations, or the latter may have been due to inflammatory oedema, which induced after changes in the hyaloid. *Lens* appeared normal. *Ciliary body* thinned, and area within ciliary processes enlarged; suspensory ligament stretched. O. D. not cupped. Examined after four days' chromic acid treatment.

Vitreous full of pinkish, soft, fibrinous-looking but friable matter, containing a few blood-corpuscles and some products of degeneration: probably old blood-clot.

The eye had been damaged thirty years before after small-pox, but retained fair sight. After injury, it rapidly inflamed; cornea ulcerated and perforated. Was quite blind with injured eye for at least two months before excision. At time of excision.—T. +; eye congested; cornea hazy, and at seat of perforation staphylomatous. No A. C. Large upper and lower equatorial staphyloma.

The eye said to have become "quite blind" directly after accident, and to have bled a good deal. For next three weeks it was very painful. At time of excision it was shrunken, soft, and tender when pressed. The L. eye was quite normal.

Right eyelid struck by a stone; the eye itself believed not to have been injured.

R. eye struck by a stick.

George A.,
53.
June 27,
1871.
No. 50.
Lawson.

Wm. F., 39.
March 12,
1872.
No. 159.
Lawson.

TABLE III.—EYES LOST BY BLOWS, SCRATCHES, &c. (*continued*).

Name, Age, Date of Excision. Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Mrs. G., 58. Sept. 25, 1872. No. 249. Hulke.	Blow on R. eye.	4 months.	Never saw more than shadows after acci- dent. Great pain and glaucomatous tension followed, and iridectomy was done about two weeks after acci- dent, which relieved pain. About four weeks before excision, however, pain- less sympathetic inflammation of other eye set in, and at date of excision it was as follows:—L. eye, sympathetic iritis, with bulged iris of greenish colour; pupil excluded and perhaps occluded, its area white, cornea (or aqueous?) rather dull. No congestion. T. n. (or —?)	Hardened in alcohol. <i>Lens</i> found at lower and inner part of vitreous, on hinder part of ciliary body; its capsule <i>in situ</i> , and slightly adherent to iris. <i>Vitreous</i> contained a little fluid, but was for most part tough and stringy in front, granular and flocculent behind, and everywhere opaque from albu- minous infiltration. Inflammatory cor- puscles found in abundance in hyaloid covering ciliary body and suspensory liga- ment. <i>Choroid</i> much thickened behind, especially about Y. S., the change gradually diminishing from behind forwards, so that in front the choroid looked normal. <i>Retina</i> <i>in situ</i> , and showing no macroscopic changes.
			R. eye—Cornea steamy on anterior sur- face, and showing numerous white dots on posterior surface, especially at lower part (keratitis punctata). Iris blue, slight posterior synechia at lower part. Lens displaced into vitreous, where it moves freely about; it is opaque and white.	

James K., 46. Feb. 13, 1872. No. 148. Critchett.	7 months. Blow on L. eyeball (not eyelids he believes) by a horse's bit.	Eye was painful and red for about two weeks after accident, then got quite well and he thought no more about it till two months before excision, when it became gradually inflamed and very painful again. The pain continued till excision. Sight lost five weeks before operation. Came to hospital about ten days before excision with cornea perforated by an ulcer, and iris prolapsed into wound. The pain was probably due to the corneal ulceration, and not to any more deeply seated changes.	Immediately after excision on upper and outer part of cornea, quite away from the ulcerated surface, were two vesicles; they were thin, contained clear fluid, were rather abruptly raised above surface, of irregularly elongated forms, and one much larger than the other, the larger being quite $\frac{3}{8}$ inch (3.12 mm.) long by $\frac{3}{16}$ inch (1.25 mm.) wide. No A. C. Iris blue grey, apparently healthy. Chronic acid ten days. Vitreous in an early stage of inflammation, showing moderate general haze and containing numerous large inflammatory cells, mostly round, but some stellate. Lens slightly opaque, perhaps from chronic acid. Retina and choroid <i>in situ</i> and not obviously diseased, but not examined microscopically.
Margaret D., 51. Jan. 2, 1872. No. 128. Bowman.	7 months. L. eye struck by a fist.	Vision with L. eye reduced directly after accident to perception of large objects, and in about three months lost altogether. At date of excision—L. eye, no perception; A. C. full of blood; pupil very wide; T. —. Much pain present ever since accident, and this was worse for two or three weeks before excision.	Eye much elongated by presence of a large posterior staphyloma at region of Y. S. Length from centre of cornea to most prominent part of staphyloma $1\frac{3}{16}$ inch (32.5 mm.). Retina detached from choroid, as far as ora serrata, still attached at O. D., and also by a thin cord of stretched retinal tissue to the most bulging part of staphyloma. Subretinal space full of blood. Lens opaque at centre, otherwise normal. Staphyloma very large, and formed entirely by the sclerotic considerably thinned, the choroid terminating by any apparently abrupt edge all round the bulging part, and being quite absent from the staphylomatous area itself. Much diffuse stretching of choroid. Chronic acid three days. A cast of this eye kept in the museum, as well as the specimen itself.

TABLE III.—EYES LOST BY BLOWS, SCRATCHES, &c. (*continued*).

Name, Age, Date of Excision, Register No &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Caroline C., 41. March 22, 1872. No. 162. Critchett.	She struck her L. eye against the corner or edge of some metal article.	18 * months.	Ulceration of cornea followed the blow, and an operation was done for it at St. Bartholomew's Hospital; the eye, however, became blind afterwards. At date of excision, there was also a vascular ulcer of R. cornea of some standing, for which an operation was also done at the same hospital, and a second operation (peritomy) was performed at Moorfields, when L. was excised. It seems probable that the ulceration of L. cornea was simply initiated by the blow, and that the latter was only remotely the cause of the eye being lost.	Eye much shrunken. <i>Cornea</i> represented by a small semiopaque disc of scar-tissue; four deep grooves radiate from it to the centres of insertion of the recti. Chromic acid seven months. <i>Vitreous</i> contained a large clot of red blood, and much whitish cheesy matter. Partial detachment of retina in folds whose outer surfaces are in close apposition. Cheesy soft substance in subretinal space. No lens.
Wm. K., 62. Feb. 22, 1872. No. 151. Streatfield.	L. eye struck by a stick one end of which sprung back against the eye.	2 years.	The eyelids were not "black" after the accident, and the eye itself only a little "blood-shot." Sight lost almost directly after accident and quite extinguished a day or two later. He did not notice any enlargement of the eye. For two months before excision had pain across forehead bad enough to keep him awake. About same time R. eye failed, and on examination at date of excision of L. showed a condition of well-marked neuritis. V. of R. was then only shadows. The frontal pain was completely relieved	Examined twenty-four hours after excision, after being kept in wet lint; T., then much +. Corneal epithelium rough, and in parts semiopaque; a minute hemispherical, clear elevation, like a vesicle, near one margin. Iris light brown. Globe transmitted light well. Large equatorial staphyloma, complete, but much the most marked between superior and external and between external and inferior recti. Tendons of all muscles unusually thick and wide. Chromic acid a few days; a cast then taken of the eyeball, to show the staphyloma at equator. Globe then divided at equator.

No naked-eye changes sufficient to account for complete loss of sight immediately after accident, and probably patient's statement to that effect was erroneous. *Retina* appeared normal from equator backwards. *O. D.* not cupped. At equator retina became closely adherent to the much attenuated chryoid. The *choroid* itself was so atrophied at the equator as to be barely recognizable, and elsewhere was more or less atrophied; the hinder part of *ciliary body* was atrophied, but ciliary processes looked normal. *Lens* absent; its capsule formed a thin septum across ciliary area, with some patches of opacity in it; no adhesions to iris. It is not unlikely that the lens-capsule may have been ruptured by the blow; the rapid failure of sight would then be accounted for by swelling and opacity of lens. The *vitreous* was opaque, tough, and gelatinous. No microscopic examination of any part. No scar anywhere.

Chromic acid for a few days. *O. D.* very deeply cupped, but edges of cup not overhanging, probably indicating that the atrophy did not yet involve all the nerve fibres of the intra-ocular part of *O. N. Retina in situ. Hyaloid* somewhat tougher and more rigid than usual, but very easily separable from retina, and showing an abundance of round corpuscles. *Vitreous* in front tough and stringy; there and elsewhere contained albuminous coagulated particles, granular matter, and oil-globules. Lines and little patches of heaped-up pigment in *choroid* showed presence of old choroiditis.

by the excision; he had not referred it to the L. eye.

Sight was much damaged directly after accident, and quite lost in a few days. The eyelids did not turn "black" after blow, nor was eye much inflamed. She thinks damaged eye did not differ much in appearance from the other till two or three years after accident, when it began to enlarge. At various times after accident eye was moderately red and painful. Other eye never affected at all. At time of excision—L. eye, large ciliary staphyloma at upper part, passing into a complete but much narrower one, which goes all round cornea. Lens transparent, and displaced towards largest part of staphyloma. No perception. No ophthalmoscopic examination made.

5 or 6 years.

L. eye struck by her own hand, which slipped as she was lacing her boot.

Susan W.,
19.
Feb. 15,
1872.
No. 150.
Hutchinson.

TABLE III.—EYES LOST BY BLOWS, SCRATCHES, &c. (*continued*).

Name, Age, Date of Excision, Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Matilda S., 40. Oct. 2, 1871. No. 95. Hutchinson.	R. eye struck by piece of wood. Doubtful whe- ther it was wounded or not.	2 years.	Some sight remained for two or three months after the accident. The eye had been occasionally inflamed and painful, and about twelve months before excision it began to "grow out." The other eye had been often irritable and intolerant of light since accident to R. At date of excision—R. eye, large hemispherical staphyloma in posi- tion of cornea, probably following a large perforating ulcer the result of the blow.	Chronic acid about three weeks. <i>Lens</i> of normal size and shape, opaque from chromic acid. <i>Iris</i> adherent all over to staphyloma, and much thinned. The <i>vitreous</i> and the fluid in the large posterior chamber both coagulated from presence of albuminous or fibrinous effusion. The staphyloma was in some parts thicker, in others thinner, than normal cornea. There was deep cupping of the <i>O. D.</i> , accounting probably for complete loss of sight, and at back of eye the retina was separated over a large patch from the choroid by a layer of albuminous coagulated fluid $\frac{1}{20}$ inch (1.25 mm.) thick. No evidence of wound.
Louisa D., 32. Aug. 12, 1871. No. 72. Hulke.	L. eye struck by the handle of a saucepan.	8 years.	No trouble followed until three years after accident when eye inflamed spon- taneously and vision was soon lost. Remained quiet again till two months before excision when it became in- flamed, tender, and painful, and made R. eye irritable. This continued till excision, at which time L. was shrunken, very tender and showed some ciliary congestion.	Eye very small and much puckered. <i>Cornea</i> showed a horizontal band of opacity, corre- sponding to palpebral fissure, and studded with little granular bodies. <i>Lens</i> shrivelled and stony. <i>Iris</i> covered in front by thick false membrane, which also occluded pupil. <i>Retina</i> scarcely recognisable. A thin plate of bone within choroid surround- ing <i>O. D.</i> Much cholestearine in position of retina and vitreous within the choroid.

Some reddish fluid, not, however, containing blood-corpuses, between choroid and sclerotic. *Sections of cornea* taken through the band of opacities above mentioned showed at the seat of the opacities—1st, puckering of Bowman's membrane; 2nd, perforations in this membrane of a diameter equal to from six to twelve times its own thickness; through these passed finely wavy fibrous tissue, continuous on the one side with the superficial layers of the fibrous cornea and on the other spreading out far beyond the aperture in Bowman's membrane and gradually thinning out until no longer perceptible; 3rd, the epithelium was lifted off from Bowman's membrane by this eruption of organised fibrous tissue; it was, moreover scanty and irregular, although this may have been due to carelessness in making the sections, &c.; 4th, in various parts of cornea small collections of round or more or less spindle-shaped cells; these collections run chiefly parallel to corneal corpuscles; some of them have an appearance of being aggregated round a central channel (? blood-vessel), but no distinct evidence of blood-vessels was found. They occur in all parts of cornea, some being close to Descemet's membrane, but are more abundant beneath the band of roughened cornea than in the parts which showed no naked-eye change on surface. Bowman's membrane itself looked normal. Superficial layers of cornea did not show the corpuscles well; they were represented chiefly by fine lines.

TABLE III.—EYES LOST BY BLOWS, SCRATCHES, &c. (continued).

Name, Age, Date of Excision. Register No. &c.	Nature of Accident.	Time between Excision and Accident.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
John S., 37. Aug. 22, 1871. No. 80. Critchett.	L. eye struck by fist; sight gra- dually failed. A second blow, 1½ year later, from a snow-ball. Quite blind.	12 years. 8 years.	Eye remained quiet till two weeks before excision; it then became suddenly very painful after he had been writing for some time. Pain went off in a short time but returned on similar use of the other eye a few days later, and the R. eye became weak and watery. Was always short-sighted, and on ex- amination R. was found myopic about ⅓; it is probable that the myopic state of the L. predisposed it to in- flammatory changes. At time of excision L. eye had no percep- tion; cornea was steamy, especially opposite palpebral fissure; T. + ; globe very tender; ciliary and some conjunctival congestion. Pupil acted slightly; iris drawn backwards into funnel shape; a white floating body (lens) seen at lower part behind iris.	Globe not appreciably elongated. <i>Retina</i> de- tached in umbrella form as far as ora serrata, and shrunken. <i>Lens</i> calcareous, somewhat shrunken, loose at bottom of the much diminished vitreous chamber. <i>Choroid</i> ex- tremely atrophied, only a few small patches retaining their pigment. At inner and lower part of ora serrata an arc of <i>partly</i> <i>ossified tissue</i> taking about one-fourth the circumference of the eye and continued backwards into a large plate of tough, fibrous (but not yet ossified) tissue on inner surface of choroid.
Joseph C., 70. Sept. 21,	L. eye struck by a chair.	20 years.	Some sight remained till about one year before excision, after which eye became blind. A short time before excision	The opaque <i>lens</i> escaped during excision. <i>Vitreous</i> yellowish, and somewhat firmer than normal. <i>Retina in situ</i> , and appeared

cornea ulcerated, and was deeply infiltrated with pus at date of operation.
R. eye perfect.

healthy to naked eye, and in recent teased-out specimens under microscope. *Lens-capsule* was adherent to iris in part, and contained a number of pus-like corpuscles: these may have been accidentally introduced from a. c. after escape of lens, or the result of proliferation of capsular cells.

At upper and outer half of equator a large arc of old *choroiditis* occupying one-third of the circumference, composed of small round heaps of pigment single or collected into groups, and of some atrophic patches without pigment accumulation. None of the spots felt gritty as in so-called "colloid" disease. The *retina* was adherent to the pigment spots, and its structure tore rather than separate from them. Opened immediately after excision and examined fresh. In this specimen it is probable that the *choroiditis* was the result of the blow, but it is doubtful whether either the cataractous state of the lens, or the recent corneal disease were connected with the remote injury; there was however, no cataract in opposite eye and this is in favour of the cataract in left being secondary. He was questioned closely as to syphilis and no evidence could be obtained that he had ever had it; there seems therefore no reason to suspect that the *choroiditis* was due to syphilitic taint.

TABLE III.—EYES LOST BY BLOWS, SCRATCHES, &c. (*continued*).

Name, Age, Date of Excision. Register No. &c.	Nature of Accident.	Time between Excision and Accident.	State of Injured Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Francis H., 56. Aug. 4, 1871. No. 68. Lawson.	L. cornea scratch- ed by a piece of wire. (He be- lieves wire pene- trated the eye.)	18 days.	Seen eight days after accident; cornea infiltrated and sloughy; T. n. Next day paracentesis was done, but hypopyon increased and eye was excised a few days later. R. eye perfect.	<i>Lens</i> escaped through hole in cornea during excision. <i>Choroid</i> and <i>retina in situ</i> , appeared normal to naked eye, but choroidal epithelium stripped off more easily than usual and remained adherent to retina as seen in some cases of recent retinal oedema. <i>Vitreous</i> reddish and semi-opaque, containing granular matter (albuminous, probably) and small acicular crystals (blood crystals?).
George B., 30. Oct. 15, 1872. No. 256. Lawson.	R. eye injured by a bit of coal- dust.	5 weeks.	The eye had already been inflamed and "weak" from dust, &c., when in the army at the Cape of Good Hope. The bit of coal-dust was removed by a comrade but ulceration and perforation of cornea followed.	Eye burst during excision. Opened next day without preparation. Commencing inflammation of <i>vitreous</i> , most marked on ciliary body and in hyaloid fossa; strings consisting of fibrinous basis with a great many large round corpuscles. At hinder part vitreous almost clear and containing no corpuscles, but coagulating freely when heated showing albuminous infiltration. Hyaloid separates very easily from retina, owing to inflammation. <i>Lens</i> absent; its capsule present. <i>Retina</i> showed two considerable blood patches near equator, and

there was slight swelling and haze of O. D. No good sections of O. D. made, though specimen was hardened on purpose. Sections of *choroid* near O. D. showed early stage of suppurative inflammation, thickening from abundant infiltration with inflammatory cells.

Immediately after excision T. —; *cornea* opaque and showing black spots of iris at seat of perforations. *Vitreous* for the most part opaque and stringy, but fluid at back of eye. It contained a considerable number of large inflammatory corpuscles. *Retina* and *choroid* looked normal to naked eye; not examined microscopically. *Lens* much rounder than normal, probably from imbibition of fluid. Chronic acid one month.

Examined at once. *Retina* detached in umbrella form, semi-opaque, folded and wrinkled in an unusual way, and containing a little fluid and stringy *vitreous*. *Sub-retinal fluid* clear, watery and nearly colourless. *Choroid in situ*, much atrophied in a ring which quite surrounded O. D. and was about half its width; from the ring a broad patch of atrophy extended outwards a little beyond Y.S. I did not ascertain whether other eye was myopic. *Lens* absent.

Came to hospital a fortnight after accident with hypopyon-ulcer of R. cornea. Hot belladonna fomentation for ten days; then iridectomy. Operation followed by increase of hypopyon and sloughing of cornea. Never much pain. Patient a healthy house-painter and had often before got foreign bodies into his eyes without serious result. At date of excision—Other eye painful. Next day it was better and the sight good.

Ten years after first accident he had operation for "artificial pupil," but could never see well enough to read with injured eye afterwards. After second accident all sight was lost. Had some inflammation of same eye, which left a white speck, at *æt.* 5 years. Lately L. again became painful and R. irritable. At date of excision, L. eye a good deal shrunken, dense leucoma at upper and inner part of cornea, large artificial pupil upwards and outwards. Iris brown.

R. eye improved after excision of L.

Thomas O.,
41
Jan. 19,
1872.
No. 138.
Lawson.

R. cornea abraded
by a piece of
hard putty.

About
6 weeks.

27 years.
4 years.

L. eye pricked.
Blow by finger-
nail.

Henry S.,
32.
Oct. 2, 1872.
No. 251.
Couper.

TABLE III.—EYES LOST BY BLOWS, SCRATCHES, &c. (*continued*).

Name, Age, Date of Excision. Register No. &c.	Nature of Accident.	Time between Accident and Excision.	State of Excised Eye since accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
James B., 18. Sept. 5, 1871. No. 84. Couper.	R. eye burnt by melted sawdew- ing metal. A piece as large as a sixpence taken out di- rectly after- wards.	1 month.	Three days after accident cornea was slightly hazy and conjunctiva exten- sively whitened. Afterwards cornea sloughed. At date of excision, eye was somewhat shrunken and very soft; sclerotic veins congested.	<i>Vitreous</i> normal to naked eye. <i>Retina</i> sepa- rated slightly from choroid in many little folds which radiated from neighbourhood of O. D. No apparent thickening of <i>retina</i> or <i>choroid</i> , and sections of the latter near Y. S. looked normal under microscope. <i>Between retina and choroid</i> thin layer (not present everywhere, and notably absent around O. D.) of white soft inflammatory matter, consisting of pus-like corpuscles and a smaller number of large corpuscles uniformly granular and slightly pigmented; both these were probably results of over- growth and proliferation of choroidal epithelium. There were also very numerous ill-defined corpuscles, smaller than pus- cells, and of doubtful nature. <i>Lens</i> had burst its posterior capsule and some lens- matter was protruding into vitreous; this was not accidental, for the eye was opened transversely at equator. Chronic acid five days.

Joseph W.,
24, a negro.
Oct. 31,
1871.
No. 106.
Couper.

6 years.

A drop of coal
tar fell into his
left eye.

Sight of L. eye was lost in about one week after injury. After that the eye remained quiet till three weeks before excision, when it became painful and red. At time of excision eye somewhat shrunken, lens opaque. For three weeks R. had also been failing; on admission, Iritis with slightly steamy cornea, great congestion and some pain; V. large letters. From the history it seemed most likely that he had had Iritis before, and that the present attack was chiefly conjunctival rather than sympathetic. This borne out by marked improvement following use of astringents.

Large opacity near inner margin of *cornea*. *Iris* normal to naked eye. *Lens* somewhat shrunken but of good shape, opaque at centre and in a streak passing from centre towards posterior surface; opacity consisted of myeline globules and masses, laminated (probably amyloid) bodies, and a little cholestearine. *Ciliary body* at upper and inner part atrophied, the corresponding ciliary processes having shrunk away from margin of lens. On outer surface of this atrophied part a minute, firm, round, whitish body, close to one of the larger vessels, and also close to a nerve; looked like an encapsuled foreign body of very minute size. On teasing it was found to consist of tough fibrous tissue, apparently containing a small coil of the blood-vessel (? aneurismal dilatation). The O. D. and extraocular part of O. N. atrophied. *Retina* and *choroid* healthy to naked eye; no epithelial disturbances of choroid when magnified. Chronic acid five days.

TABLE III.—EYES LOST BY BLOWS, SCRATCHES, &c. (*continued*).

Name, Age, Date of Excision, Register No. &c.	Nature of Accident.	Time between Excision and Accident.	State of Injured Eye since Accident and at time of Excision. State of other Eye.	Changes found in Excised Eye.
Charlotte D., 15. Aug. 20, 1872. No. 234. Critchett.	L. eyelids injured in some way by a skipping-rope.	About 5—6 years.	The injury resulted in severe ectropion. Has had two or three operations at other hospitals during last five years, but does not know whether on the lids or the eye. She thinks the eye has been "growing out" for four years, and quite blind for about three years. At time of excision—L. cornea and ciliary region appear uniformly enlarged. Cornea universally opaque, but densest white at centre, where it appears thickened and shows a few rather large "sea-weed" vessels, which seem to emerge from or dip into centre and do not reach to corneal margin. The eye has never been painful. R. eye quite good; can see well at long distances, and is therefore not myopic, at least not in any important degree.	Eye much elongated, apparently by enlargement of anterior part of sclerotic and of cornea. Corneal curve uniform; circumference circular; diameter $\frac{7}{16}$ inch (18 mm.). Antero-posterior diameter of eye $1\frac{1}{8}$ inch (29 mm.). Horizontal diameter at equator $1\frac{1}{16}$ inch (26.5 mm.). Chromic acid (1 per cent.) for three months. Antero-posterior section. O. D. deeply cupped. Retina and choroid look normal to naked eye. Vitreous fluid but containing a large quantity of coagulated, soft material; the same in A. C. Lens represented by a thin disc, convex forwards, concave behind, attached by a considerably stretched suspensory ligament to ciliary processes, and by a tough pillar of fibrous tissue about $\frac{1}{16}$ inch long to back of centre of cornea; the pillar at its central and thinnest part was about half as thick as a No. 1 eye-probe. Iris quite free from lens and no signs whatever of synechia; pupil round and rather large. Iris much wider than normal but too thin. Cornea considerably too thick at centre and too thin at circumference. Close examination shows that

the increase in size of front of eye has occurred chiefly by stretching (with some compensatory growth) of sclero-corneal junction, especially of its corneal part. The *ligament. pect. iridis*, and iris with it, have been stretched forwards in the same proportion as the corneal circumference itself, while the ciliary attachment of the iris has remained unaltered in position. The part of iris between these attachments, remaining in close contact with the stretched and overgrown corneal circumference, has also elongated very much, the result being an immense posterior chamber co-existing with a deep anterior one. The *membrane of Descemet* had given way near its circumference over a large part and has curled forwards into a minute roll composed of two and a half or three close spiral turns; in other parts it had ruptured without curling up, while through the large apertures thus left new tissue had passed and spreading out, had covered large portions of the inner surface of Descemet's membrane, gradually thinning away until imperceptible. This new tissue closely resembled normal corneal connective tissue. Epithelium of Descemet's membrane represented by a thin line of finely granular matter in which no cells were distinguishable. *Cornea* contained numerous blood-vessels in its anterior layers extending about one-third through its thickness. Corneal nuclei very abundant, several in each corpuscle, and small; this change chiefly also in front layers. No trace of Bowman's membrane in any sections. Anterior epithelium normal.

PERFORATING ULCERATION OF CORNEA.

79. *Hypopyon Ulcer of Each Cornea at same time in a Young Man without known Cause—Excision of one Eye for Slough of Cornea.*

John L., 25, patient of Mr. Streatfeild, had his left eye excised on August 21, 1871. The lower half of the cornea had sloughed and there was great chemosis. During excision, most of the contents of the eye, including the retina, escaped; the *choroid and ciliary body* looked healthy to the naked eye. The eye had been inflamed for about three weeks before he came to the hospital. The other eye was also suffering from superficial ulceration of the cornea with large hypopyon. The patient was a farm-labourer, earning about ten shillings a week; he knew of no cause for his eye disease.

238. *Cornea burnt by Lime six weeks before Excision—Perforating Ulceration of Cornea—Large Effusion of Albuminous Fluid between Choroid and Sclerotic—Retina not Detached—Commencing Inflammation of Vitreous.*

John H., 58, had one eye burnt by lime five or six weeks before excision. A ditch ulcer formed almost all round the corneal margin, and a funnel-shaped one at the centre which after a time perforated. About a fortnight after excision there was a large hypopyon and the marginal ulcer; no increase of tension. The eye was excised Sept. 2, 1872, by Mr. Hutchinson. It was kept in Müller's fluid for two months and then opened. There was extensive detachment of choroid from sclerotic by coagulated gelatinous semi-opaque matter, in which no cells or blood-corpuscles existed. The detachment extended up to the attachment of the ciliary muscle in front, and to within about $\frac{1}{8}$ inch (3.12 mm.) from the optic disc behind. The *retina* was still in contact with the choroid. There was early inflammation of the *vitreous* shown in its being gelatinous, semi-opaque, and diffusely infiltrated with round corpuscles of various sizes and a few red blood-corpuscles. The *lens* looked somewhat too convex, probably from slight swelling. The *iris* was thickened, and the *ciliary muscle* slightly swollen and softened.

177. *Perforating Ulcer of Cornea after a Blow by a Twig—No obvious Disease at back of Eye.*

The left eye of John J., 30, an under gardener, apparently in excellent health, florid, spare, with nearly black hair. The left eye was struck by the twig of a tree two months before excision; perforating ulcer of the cornea followed, and all sight was lost in about a fortnight. The eye gave him much pain. During excision the cornea burst, and the lens, and greater part of the vitreous escaped. No further examination was made; what remained of the vitreous looked healthy, not suppurating.

226. *Eye Lost by perforating Ulcer of Cornea—Excision a few weeks after—Early stage of Inflammation of Vitreous—Effusion of fluid between Sclerotic and Choroid, with plait-like Detachments of Retina and thickening of the Choroid.*

Abel S., 2 years, had ulcers on each cornea about four months before excision of his left eye; it was not known when the left cornea gave way, but on admission, August 6, 1872, there was almost complete perforation with hernia of the posterior elastic lamina and iris, the rest of the cornea being semi-opaque. The ulcers had formed after he had been for several months in bad health, and about a fortnight before admission he was believed to have had chicken-pox. Mr. Bowman excised the eye the same day. Very soon after removal T was —. The eye was of good shape.

It was examined after treatment with Müller's fluid for two and a-half months. The *vitreous* was cloudy, and had partly lost its normal toughness from diffuse infiltration with albuminous fluid which had become gelatinised by the preservative; in front it was rather abnormally stringy. Its most central part contained a good many scattered well-formed red-blood discs which were also present in the anterior part. There were numerous inflammatory corpuscles, some large, round, or multipolar, and others like pus cells, on the hyaloid and in the anterior part of the vitreous; in the latter situation was also a number of slightly curved acicular crystals, and on the hyaloid, which separated very easily from the retina, many collections of hyaline (albuminous or colloid?) globules. There was slight separation of the *retina* in a few close folds, due to the detachment of the *choroid* from the

sclerotic by a thin layer of fluid. None of these reached nearer than $\frac{1}{4}$ inch (6.25 mm.) to the disc. The *choroid* itself was thickened. The *lens* looked healthy. There was a central anterior synechia at the position of the corneal perforation, the latter being filled by a button of granulation tissue. The anterior chamber contained translucent coagulated matter. No microscopic examination of any part was made.

165. *Perforating Ulceration of Cornea without known Cause in a young Patient, causing complete Corneal Staphyloma.*

The right eye of Sarah S., 14, removed by Mr. Streatfeild March 25, 1872. At the time of excision there was a large, rather irregular corneal staphyloma. The eye "inflamed" six months previously without known cause and was said to have been perfect before this attack. She had a good deal of very severe pain since the sight was lost and her health suffered in consequence, but the other eye was not affected.

In this eye (after hardening in chromic acid for seven months) the *vitreous* was found to be opaque, soft, and gelatinous, doubtless from albuminous effusion into it, indicating an early stage of inflammation. There were no naked-eye changes in the *choroid* or *retina*. The *cornea* was irregularly and considerably thinned, being everywhere of less than its normal thickness; its posterior surface was covered closely by the iris. There was no alteration of the *lens*, but its *suspensory ligament* was greatly elongated by bulging outwards of the ciliary region. No microscopical examination of any part.

55. *Perforating Ulcer of Cornea without Injury—Secondary Suppurative Inflammation of the Choroid, Retina, and Vitreous—Softening and rupture of Sclerotic.*

The right eye of Richard S., æt. 62, removed by Mr. Hutchinson July 3, 1871. Five months before excision the eye inflamed without apparent cause; sight was lost in about a month. When he came to the hospital the cornea had sloughed at its centre and the globe was suppurating. He refused excision for three weeks, after which interval the eye had begun to get less inflamed. Examined directly after excision it was found that the *sclerotic*,

softened by inflammation, had ruptured behind the insertion of the rectus internus, and a large ragged hole was the result. The *iris* protruded from the corneal aperture. The *lens* had escaped. There was recent advanced suppurative inflammation of *retina* and *vitreous*, and abundant infiltration of the *chorio-capillaris* with pus cells. The deeper layers of the choroid and the *sclerotic* were cedematous and contained finely granular matter, but no new corpuscles.

112. *Eye lost by Ulceration of Cornea from exposure in a case of Exophthalmic Goitre—No special changes in the Eye—Small Congenital gap in Retina, near Ora Serrata.*

Mary Anne O., 20, a servant living near Clare, in Suffolk, was under Mr. Wordsworth's care in November, 1871, for total staphyloma of the right cornea; its surface was dry. The globe was much congested and painful, and conjunctiva cedematous. The eye had inflamed about six months before, and sight was rapidly lost. It was treated with "bluestone" at a hospital but without benefit. At the time of excision she had been suffering from Basedow's disease for about 16 months, the chief symptoms being marked exophthalmos, palpitation, nervousness, slight fulness of the thyroid gland, with excessive pulsation of the carotid arteries, and such branches (the temporals), as were examined. She had not been able to close her eyelids completely for some time before the right cornea became ulcerated, and when she came to the hospital the greatest effort at closure still left a chink from $\frac{1}{10}$ to $\frac{1}{8}$ inch wide (2·5 to 3·12 mm.) between the lids of the healthy eye. With the latter she could see perfectly, but it was becoming watery and painful.

The excised eye was examined after 10 days' hardening in chromic acid. Excepting the cornea, which was thickened in most parts and thinned at the centre, and the iris which was extensively adherent to the cornea, none of the ocular structures showed any naked-eye or microscopical changes. The arteries perforating the sclerotic at the back of the eye presented no evidences of change: their circular muscular coat was very well shown, but not excessive, and their calibre was not increased perceptibly.

A point of some interest was the existence of a slight gap in

the *retina*, doubtless congenital, at the ora serrata at the lower and inner part of the eye. In front it was about as wide as one serration and a half of the retinal free border, behind as wide as one serration, while its antero-posterior length was equal to its greatest breadth.

Perforating Ulcer of Cornea during Lactation—Staphyloma of Cornea—Pyramidal Cataract—Changes in the Lens.

Rosina A., æt. 39, lost her left eye about ten months before excision, by the occurrence of ulceration of the cornea followed by perforation. She was suckling when the eye inflamed. Mr. Couper excised the lost eye on September 5, 1871. There was a large opaque hemispherical staphyloma at the centre of the cornea, the normal cornea being present only in the form of a narrow zone encircling the base of the prominence. The eye was dissected after a week's treatment with chromic acid. All the parts behind the lens appeared to the naked eye healthy. The corneal staphyloma was very thick and quite opaque. Near to the centre of its inner surface was attached the anterior foot of a cord of opaque, white, tough tissue whose hinder end was joined to the anterior lens-capsule. The *iris* was spread on the posterior surface of the cornea, and was intimately adherent to it in the neighbourhood of the above-named fibrous cord. Perforation had in all probability occurred at the part into which the fibrous cord (pyramidal cataract) was inserted, and where also the iris was most adherent.

Microscopic examination of the *lens* and *anterior capsule* near to the lenticular end of the cord showed the capsule to be normal and lined by the usual single layer of flat cells with large single nuclei, but beneath these were several layers of inflammatory cells, round, slightly granular, and about as large as pus corpuscles. No examination was made of the foot of the pyramidal cataract itself, or of the lens-capsule immediately underlying it. The lens itself was shrivelled and showed many white specks at its margin consisting of spherical globules not dissolving in nitric acid, primarily connected with lens-fibres but often also aggregated into separate compound masses, probably myeloid globules. Lens-fibres otherwise healthy. Many opacities and thickenings of capsule, especially at junction of its anterior and posterior layers.

A much shrunken Eye lost $2\frac{1}{2}$ years before, probably by Corneal Ulceration.

The right eye of James B., 36, excised by Mr. Streatfeild April 25, 1872. It became blind gradually by "a cold" (in about six months) $2\frac{1}{2}$ years before excision, and had not been painful since. There was a large nebula on the cornea of the other eye. The excised eye was only as large as a bean, and squared. It contained no lens. The choroid and retina were fused into a fibrous mass, and there was no bone in the eye.

153. Perforating Ulcer of Cornea and loss of Lens eight years—Eye shrunken—Retina detached—Colloid disease of Choroid.

Abraham W., 16, lost the sight of his left eye by spontaneous inflammation at the age of eight years; he was much out of health at the time, having had bad sore throats but no definite illness. The eye was lost in about a week, no doubt by ulceration and perforation of cornea. Lately the right eye had been painful, its visual power was however good. The lost eye had not troubled him at all lately; it was excised by Mr. Wells February 23, 1872. The eye was much shrunken, the cornea flat and opaque. There was flask-shaped detachment of the retina. The lens was wanting. On the choroid were a great many "colloid" bodies of small size, and still covered by the epithelium; they were very abundant in front of the equator, much less so behind it. The whole choroid was well pigmented. The sclerotic was thick.

126. Perforating Ulcer of Cornea followed by large Anterior Synechia and large Corneal Staphyloma—Iris torn from Ciliary Border in several places—Suspensory Ligament stretched and partly ruptured—Ciliary Body not displaced—Detachment of Hyaloid—Atrophy of Rods and Cones and commencing Pigmentation of Retina.

The left eye of John H., æt. 14, under the care of Mr. Wells, excised December 29, 1871. He had something amiss with both eyes when quite young. Again five years before excision the left inflamed and was gradually lost "from a cold;" no history of injury. Condition at the time of excision: he asserts that with the left eye he had perception of light. There was a large

staphyloma of the cornea at the lower part, its apex being thin and ulcerated. The upper half of the cornea was clear and there it could be seen that the iris was separated from its ciliary attachment for a considerable distance. The tension was slightly diminished. There was ciliary congestion, and the eye had lately been somewhat painful. There was no defect of the other eye.

The left eye was hardened for a month in chromic acid and divided vertically from behind forwards. The *lens* was shrivelled and hard; its suspensory ligament was absent from a considerable part of the circle, and where present was much elongated. The most unusual change consisted in the separation of the *iris* at its ciliary border for about $\frac{1}{4}$ inch (6.25 mm.) at the upper and inner part, *i.e.*, at the part farthest from the seat of corneal perforation; the separated edge of this part of the iris was curved *backwards*, and was at a considerable distance from the cornea, its pupillary border and the whole lower part of the iris being spread out on the cornea. There was thus a wide communication between the sole remaining part of the anterior chamber and the posterior chamber, and through the ruptured suspensory ligament, with the vitreous. There was likewise detachment of the *hyaloid* from the retina, the anterior part of the space being filled with membranous curtains, the posterior part with clear fluid. There were many minute elevations on the *retina*, but no other naked-eye change. The *ciliary processes* were not in the least dragged forward and looked quite healthy.

Did the detachment of iris at its ciliary border in this case occur at the moment when perforation of the cornea took place, or was it gradually effected afterwards by further yielding of the corneal staphyloma and iris adherent to it? Probably the former was the true state of the case, for gradual stretching of the staphylomatous cornea would have been accompanied by equally gradual extension, and not by rupture, of the iris as is frequently seen in cases where a very prominent staphyloma forms gradually after the greater part of the cornea has sloughed.

Although this patient said that he could distinguish light from dark with the left eye, when carefully tested just before excision, microscopical examination showed that his statement was probably erroneous, for the rods and cones were looked for were absent, being represented by a thin irregular bed of yellowish

matter connecting the *limitans externa* of the retina with the choroidal epithelium. The vertical connective-tissue fibres were thickened and their nuclei very evident, but they had not coalesced into thick pillars; the granules of the outer layer were scanty, those that were present being somewhat enlarged; the other parts were normal, excepting that the nerve cells were not evident in all parts, and were occasionally shrunken and granular. There was atrophy of the *chorio-capillaris* and of the stellate pigment cells of the deeper parts of the choroid, but the large blood-vessels were distended. A few of the epithelial cells had passed a short distance into the retina. There was no colloid disease.

174. *Corneal Disease, probably ulceration, causing permanent opacity, followed after ten years by sudden loss of sight with inflammatory symptoms and shrinking of Eye—Detachment of Retina by inflammatory effusion—Edematous thickening of Ciliary muscle—Colloid disease of Choroid.*

The left eye of Mary M., 18, excised by Mr. Wordsworth April 17, 1872. The eye was first bad when she was eight years old, and there had been "a skin over it" ever since then. Four years before excision some operation was done on it at Guy's Hospital and the sight much improved afterwards, but was still not good enough to enable her to read. She believed that it continued to improve till a few days before she came under Mr. Wordsworth's care, February 17, when it became suddenly inflamed and painful, and all sight was quickly lost. Various warm and cold local applications were used for two months and she was taken into the hospital for five weeks, but without benefit. The right eye was and always had been very good, and the patient herself looked remarkably healthy. The left eye continued painful up to the time of excision.

It was examined without hardening. It was considerably shrunken but of good shape. The *cornea* was diminished in proportion; it was roughened and showed patches of opacity, one of which was calcareous and effervesced with acid. The pupil was very wide, the iris being very narrow and in many parts adherent to the cornea. The *lens* was semi-opaque. There was detachment of the *retina* and obliteration of the vitreous chamber, the retina being folded and membranous. The *choroid* showed

on its inner surface a number of very small elevations(? "colloid" bodies) which were still uniformly covered by the epithelium; in the front part of the uveal tract the ciliary muscle was œdematous and soft, probably from inflammatory changes; it was not examined microscopically. The fluid between retina and choroid contained much albumen (nitric acid test), and was yellowish. It contained also a large quantity of white deposit quite separable from the clear fluid by settling, and made up entirely of granule corpuscles (degenerated inflammatory corpuscles) full of dark minute globules; many of the corpuscles were aggregated into little clumps. This deposit floated like cream when thrown into salt and water, and by treatment with ether was proved to be almost entirely oil.

98. *Perforating Ulcer of Cornea—Anterior Synechia—Dragging forwards of Ciliary Body—Partial absorption of Lens.*

The right eye of Mary R., 27, removed by Mr. Soelberg Wells October 10, 1871. Both eyes had been damaged by perforating ulcers of the cornea after measles many years before. At time of excision the right eye was shrunken, very soft, and congested in the ciliary region. There was a vascular scar on the upper part of the cornea. It had been in this state more or less for about three months. In the left eye there was a symmetrical staphylomatous scar on the upper part of the cornea.

Hardened in chromic acid. The *vitreous* became opaque, and was probably therefore albuminous. The *lens* was much wasted, only its peripheral parts remaining. The most important alteration was in the *ciliary body and iris*, which were much dragged forwards towards the old corneal perforation to which the iris was closely adherent.

131. *Eye excised 40 years after being lost by Corneal Disease (probably severe ulceration, perhaps perforation)—Evidence of former Neuritis—Effusion between Choroid and Retina (probably recent)—Chronic Cyclitis and Hyalitis.*

Hannah H., a single woman of 48, had some inflammation of both eyes when about eight years old; the left got well, but the right gradually became quite blind. Since then it had been occasionally painful, and after several weeks of pain she came, at

her friend's advice, to the hospital on January 4, 1872, when Mr. Critchett excised it. The cornea was densely opaque and irregular. The left eye was somewhat irritable, but otherwise appeared healthy in a superficial examination. There were no signs of hereditary syphilis in her teeth or physiognomy.

The excised eyeball was slightly enlarged in some directions. After one month's hardening in chromic acid its greatest antero-posterior diameter was $\frac{1}{1}\frac{6}{8}$ inch (26.66 mm.), the equatorial diameters taken transversely and vertically being almost exactly 1 inch (25 mm.), whilst the diameter starting at the equator midway between the superior and external recti and crossing to the opposite point measured $\frac{1}{1}\frac{6}{8}$ inch (26.66 mm.). The *old* changes found on dissection were advanced atrophy of the *optic disc*, with a shelving cup due to almost complete atrophy of the nerve-fibres; great thickening of the *hyaloid* membrane where it covered the ciliary body, with a scanty sprinkling in it of round cells rather larger than pus; fluidity of the *vitreous* behind, and a tough stringy condition with a few scattered corpuscles in front; a good many processes of considerable (microscopic) size projecting into the ciliary retina from the *ciliary body*; these probably inclosed small blood-vessels, and one undoubted vessel was seen in the same situation uncovered by pigment; there were also some minute round pedunculated growths, apparently composed of more or less altered cells and perhaps containing blood-vessels, in the same situation. The *iris* was adherent everywhere to the cornea, and the lens much too convex and rounded, was pushed forwards against the iris. There were also two or three spots of old *choroidal disease* with pigment heaping in the lower part near the ora serrata; but there was no pigmentation of retina, a fact doubtless ascribable to the very slight implication of the choroid at an early stage. The only *recent* morbid change was the existence of a thin layer of white flocculent substance between choroid and retina, slightly lifting up the latter membrane in the lower half of the eye. It was in large patches, and consisted of structureless granular matter enclosing numerous round spherical clear cell-like bodies with thin outlines resembling in refraction and size swollen red-blood corpuscles, but quite colourless. A few of them were provided with processes and were granular. They lay in a finely granular substance. They were not like any cells

derived from choroidal epithelium, and moreover the latter showed no signs of proliferation. I am inclined to think that they were of retinal origin, possibly altered rods and cones, more especially as the elements of the bacillary layer showed in most cases similar globular terminal clubs though of smaller size. The *rods and cones* in the neighbourhood of the disc were often somewhat elongated, distorted, and the bulbous parts of the cones irregularly swollen. It is most likely that the terminal swelling of the rods and cones was in part caused by the action of chromic acid, but the existence of the subretinal effusion, and the elongation of the bacillary structures must have been due to recent disease. In many sections of *retina* the rods and cones were absent from considerable tracts or represented by a few scattered ones; this may have been accidental. In all sections the nerve-fibres and nerve-cells were highly atrophied, but the other retinal structures presented no obvious changes except near the yellow spot where the rod- and cone-plexus was somewhat wasted. The *hyaloid* everywhere on the retina was thickened, hyaline, and contained corpuscles. There was atrophy of the *chorio-capillaris* and to a less extent of the deeper part of the choroid, and this was especially advanced at the rim of the optic disc where a narrow zone of choroid of unequal width was reduced to a thin fibrous layer to which the outer limiting membrane of the retina was adherent. The retina at this part was much wasted in all its layers. The *choroidal epithelium* was tolerably normal, presenting only slight enlargement and deficient pigmentation of a few scattered cells, except near to the disc, where it was absent altogether from the temporal side of the atrophic choroidal ring, and slightly heaped up from proliferation and overgrowth of its cells just at the nasal edge of the disc. The atrophic zone of choroid was widest on the yellow-spot side of the disc, and was there about one-fourth the width of the disc.

53. *Extensive formation of Bone on inner surface of Choroid in an Eye lost for many years by Corneal Disease—Recent slight Inflammation.*

The right eye of Mary Anne A., 32, unmarried, excised by Mr. Lawson July 4, 1871. The eye was lost gradually in childhood, and was she believes quite blind at æt. four years. It gave

no trouble till nine months before excision, when she had some pain and redness in it and similar attacks occurred several times afterwards. The other also became at times irritable and blood-shot. The patient was a pale woman with flabby skin, but seemed in fair health. At date of excision her right eye was tender when pressed through the lid, and slightly painful without pressure; T?—. The cornea was semi-opaque everywhere, with a belt of denser opacities opposite the palpebral fissure. The anterior chamber was shallow. It was examined directly after excision. The *lens* was superficially calcified. There was much *bone* on the inner surface of the uveal tract, forming a shallow cup around the o. n., with outlying islands at the equator, and a zone of the same covering the hinder part of the ciliary body, but not reaching quite to the tips of the ciliary processes; a narrow belt of unossified fibrous tissue intervened between the inner (or front) edge of this bony zone and the outer edge of the lens. There was a remarkable arrangement of the *choroidal pigment* (probably epithelial) into rings and meshes, the islands enclosed by them being devoid of pigment and very thin. It was noticed that where the formation of bone was progressing, the new spicules lay over the densely pigmented lines, and not on the pale islands of atrophied choroid. There was detachment and shrinking of *retina* with advanced fatty degeneration of its tissue, whilst in the remains of the *vitreous* was much cholestearine and abundant oil of globules (microscopical examination). The *iris* was atrophied, but not abnormally adherent anywhere.

OPHTHALMIA NEONATORUM AND DIPHTHERITIC OPHTHALMIA.

180. *Staphyloma of Cornea and posterior elongation of Eye, total Anterior Synechia, loss of Lens, fluid Effusion between Sclerotic, Choroid, Retina and Hyaloid; Chronic Inflammation of Hyaloid in an early stage; after Ophthalmia Neonatorum.*

Wm. P., 6 months, had purulent ophthalmia when a few days old. On April 29, 1872, he was brought to Mr. Streatfeild on account of his left eye, in which there was a prominent central corneal staphyloma, the iris being everywhere in contact with the cornea. Mr. Streatfeild excised the eye as useless and probably painful. Besides the anterior staphyloma, the eyeball was

elongated by posterior bulging. It was placed in Müller's solution for six months, but even then the sclerotic was not well hardened. It was divided transversely at the equator. There was no lens. The most important change, and probably a recent one, was the effusion of fluid between each of the coats of the eye, a thin uniform layer of it existing between sclerotic and choroid and between choroid and retina, and a large quantity between retina and hyaloid separating the latter considerably and quite up to the ora serrata. The choroid, from its elasticity, retained its proper spherical form, but the retina, being inelastic, had become accommodated to the diminished size of the interior by the formation of numerous little folds projecting inwards and radiating from the optic disc in which neighbourhood they were most abundant. The subhyaloid fluid was clear but contained soft probably albuminous flocculi, and a few scattered blood-discs. The *hyaloid* itself was thickly strewn with large corpuscles and nests of smaller ones. The former were either round or multipolar. The nests were about as large as adipose-tissue cells and contained corpuscles about as large as pus cells the central cells of each nest being round while the peripheral ones were more or less flattened concentrically, the nests thus having a slightly laminated structure. All the changes in the hyaloid pointed to a comparatively slow inflammatory process, not a pus-forming process.

103. *Staphyloma of Cornea after Ophthalmia Neonatorum—Lens Shrunken—Other parts normal.*

Thomas C., 10 months. Mr. Streatfeild's patient. Had ophthalmia neonatorum when a few days old. At time of excision the right cornea was uniformly and densely leucomatous, but not totally opaque. The globe was enlarged in all directions, so that the outer canthus had to be slit up to allow the globe to be extracted.

Hardened for one week, and divided in the antero-posterior direction. There was much shrinking of the *lens*. The *iris* was spread out on the back of the cornea, but not intimately adherent to it. The *cornea* was a good deal thickened, especially at the middle. There was no disease of *vitreous* or *choroid* perceptible to the naked eye, and the *retina* was also healthy to naked eye, and in thin sections under the microscope.

179. *Perforation of Cornea, escape of Lens, and total Anterior Synechia after Ophthalmia Neonatorum.*

Martin M., 5 months; Mr. Streatfeild's patient. His left eye was excised April 29, 1872. It was considerably shrunken and the cornea staphylomatous. A cursory examination of the perfectly fresh specimen showed total anterior synechia and absence of the lens. The vitreous was clear and of normal consistence; the retina was very slightly hazy. There were no other signs of disease to the naked eye. The child had suffered from *ophthalmia neonatorum*.

237. *Great elongation of Eye by posterior and anterior Staphyloma after perforation of Cornea from Ophthalmia Neonatorum —Glaucomatous excavation of Disc.*

The left eye of James W., 2 years old, removed by Mr. Wordsworth August 31, 1872. Both eyes were affected with purulent ophthalmia when the child was a few days old; the right recovered, but the left was lost and his mother thinks it began to "grow out" at about 12 months of age. It had probably given him some pain lately, for he had been noticed to rub it often. Before excision T +. General anterior scleral staphyloma and staphyloma of cornea; the latter presenting in addition to general bulging an especially large white prominence to one side of the centre with sea-weed vessels and nearly dry surface. After excision the hinder part of the eye also appeared much elongated, especially in the y. s. region, as in myopia. After being for three months and a-half in Müller's fluid it was opened horizontally from before backwards. The *sclerotic* was much thinned everywhere and pretty uniformly so; there was not much alteration in the naked-eye appearances of the *retina* and *choroid*, excepting the presence of a deep *glaucomatous cup* of the disc and some thinning of the neighbouring retina. The cup was shelving on the nasal and overhanging on the y. s. side, a fact probably caused by the backward pressure acting on it obliquely. There was no *lens*; its capsule together probably with the suspensory ligament and some new tissue was drawn forwards and to one side, to be attached by a short, thick fibrous cord to the most prominent part of the corneal staphyloma. The

iris was of course spread out on the back of the *cornea*: the latter structure was very thick at its central prominent part. The greatest peculiarity was the entire detachment of the *hyaloid* from the retina as far as the ora serrata in the form of a beautiful semi-transparent membrane still almost large enough to fit on to the retina; it was, however, folded forwards when seen. From the ora serrata another similar membrane extended across the eye, forming a septum placed just behind the lens-capsule; this membrane was doubtless in part a new formation, and the posterior part of the *hyaloid* was also thickened. The subhyaloid space and the cavities at the front of the eye contained soft gelatinous semi-opaque matter, with some clear fluid; there were no cells in this substance, only dim molecular structure.

225. *Perforating Ulcer of Cornea and total Anterior Synechia, followed by Ciliary Staphyloma, general enlargement of the Eye and excavation of the Optic Disc—At a later period effusion between elastic Lamina and Epithelium of Choroid (the Epithelium remaining adherent to the Retina), causing blister-like detachments of Retina.*

The left eye of Eliza B., 10 years old, excised by Mr. Streatfeild August 3, 1872. The eye had first been inflamed at the age of nine days, but no more detailed history could be obtained. At the date of excision a large ciliary staphyloma occupied the upper, outer and lower quadrants of the circumference; there was a large puckered scar at the lower and inner part of the cornea to which the iris adhered, being also in close contact with the rest of the cornea. The eye looked enlarged; there was no perception of light, T + 2, and occasional pain. The other eye was perfect, except $\frac{1}{20}$ of hypermetropia.

The globe was decidedly enlarged. It was opened after having been in Müller's fluid for $2\frac{1}{2}$ months; the tension was then —, and the sclerotic not well hardened. The greater part of the *vitreous* was fluid, except a small part in front which seemed about normal in consistence. *Lens* absent, its *capsule* thickened into an opaque disc near the corneal opacity. At the opacity the *cornea* was very thick, its remainder being of normal thickness; its hinder surface was covered everywhere by frayed out *iris* and bridges of black iritic tissue stretched across arcs of

cornea from circumference towards centre; there was no perceptible dragging forwards of the *ciliary body*. The *retina* was curiously detached in many blister-like patches of considerable area but small depth; there were none of the plaitings so commonly seen in early detachment by fluid effusion. On removing the retina all the choroidal epithelium came off with it, so that the effusion must have been beneath the epithelium, instead of between it and the bacillary layer of the retina. There was no pigmentation of the retina visible to the naked eye, and no disease of *choroid* similarly discoverable. The *optic disc* was very deeply cupped.

235. *Eye lost by Purulent Ophthalmia in infancy 37 years ago, and so shrunken as to allow Artificial Eye to be worn for last 15 years—Recent pain probably from commencement of bone-formation between Choroid and Retina.*

The left eye of Mary H., 37, removed by Mr. Hutchinson August 22, 1872. It was lost and the right much damaged by ophthalmia neonatorum, but remained so quiet that for 15 years before excision she wore a glass eye without any material trouble. Twelve years before removal, Mr. Dixon saw her and advised excision of the shrunken eye. She came on the present occasion because, for about two months past, the lost eye had been subject to attacks of pain sometimes extending all over the head and very severe. These symptoms had been accompanied by aching in the other eye.

On examining the eye after excision, a *plate of bone* was found on the inner surface of the choroid surrounding the optic disc and occupying about $\frac{1}{3}$ of the curve of the globe. In the *ciliary region* there was a quantity of pinkish brown succulent tissue between sclerotic and choroid; microscopically, it consisted of wavy fibres with distinct outlines (examined in water). The *retina* was of course a mere mass of soft brownish tissue, and there was no trace of *lens*. The eye altogether was no larger than a small cherry. Probably the plate of bone was the cause of the painful symptoms, for its small size was probably an indication of recent formation.

77. *Ulceration ending in perforation of both Corneæ in connexion with a severe illness at six months old—Diphtheritic inflammation? Perforating ulceration of cornea?—Excision of one eye two years later for Staphyloma of Cornea.*

Mary L., æt. $2\frac{1}{2}$ years, under the care of Mr. Critchett, had her left eye excised on August 18, 1871. The cornea was converted into a prominent hemispherical pinkish-white staphyloma, the surface of which soon became dry on exposure, and was in fact more like cuticle than mucous membrane. On examination no naked-eye signs of disease were found farther back than the *lens*, which was shrivelled; the *cornea* was much thickened, and the *iris* of course spread out on its posterior surface. The other eye was also almost fluid from universal opalescence of cornea; the child could tell light from dark with this eye.

The history was not, as was expected, one of ophthalmia neonatorum, for the child's eyes had remained quite well until she was about six months old. She had very bad health between two and six months of age, and at the latter age was expected to die. The eyes had been closed for a couple of weeks or so, and when opened one day, the mother noticed a "skin like a piece of bladder over them." The child recovered, but remained practically blind. There was never, the mother said, any considerable swelling of the lids. No scarlet fever or diphtheria had occurred in the house. There was no evidence of inherited syphilis in the patient nor history of symptoms in the elder child of the same family. In the absence of definite history of the child's disease, the nature of its eye affection must remain doubtful; severe ulceration of cornea from mal-nutrition would account well enough for the symptoms and pathological changes.

ACQUIRED SYPHILIS.

152. *Plastic Inflammation of Retina and Vitreous after (? caused by) perforating Ulcer of Cornea—Those structures converted into a Fleshy Mass—Inflammation and thickening of Choroid, especially just around the Optic Disc—Patient had Syphilis many years before, and has borne Syphilitic Children.*

Mrs. P., 49, Mr. Couper's patient, had good sight till the summer of 1871. Her left eye then inflamed and was soon blind.

It continued painful till the date of excision, February 19, 1872, at which time the eye was shrunken, the cornea puckered, and a large ragged perforating ulcer seen at one part of its edge. There was a history of a short attack of "inflammation" in the same eye many years before, but the other eye had never ailed anything.

The specimen was examined roughly at once and then hardened in Müller's fluid. The eye was filled completely by a firm fleshy whitish-pink mass which represented the *retina* detached, folded up and fused into one with the inflamed *vitreous*, both together forming a mass which was in loose contact with the choroid and was attached behind to the optic disc. When hardened the retina could be traced imperfectly by some ill-defined convoluted lines diverging slightly from behind forwards, but could not be separated from the vitreous anywhere. On the outer surface at the hinder part was a thin layer of soft separable substance, probably fibrinous effusion. There was also marked thickening of the *choroid* in all parts, but especially just around the optic disc, where it formed quite a projection into the eye closely resembling in form a swollen optic disc. On one side in front of the equator the choroid could be readily separated into two layers which proved on microscopical examination to be due to the separation of the ciliary muscle and choroid proper from the *lamina fusca*, which was so thickened by inflammation as to constitute a distinct structure at that part. The thickening of the choroid both at the fundus and in the ciliary region was caused by the abundant formation of granulation tissue chiefly in the round-celled stage, the choroid where not extremely thick being infiltrated with lymphoid cells; these also occurred in groups in the interstices of the sclerotic, and were scattered profusely through the tissue of the optic nerve. The fibre-cells of the *ciliary muscle* did not appear to be altered, although they were, so to speak, dissected from each other by numerous round corpuscles and albuminous fluid.

Mrs. P. had secondary syphilis (rash and sore mouth) three months after her first marriage; this was followed by six miscarriages, and then came her only live-born child, a girl at present 18 years old who had been under Mr. Critchett's care for "cataracts" and "disease at the back of the eyes" the mother said. I afterwards saw this girl and she presented in all respects

a typical example of hereditary syphilis; prominent frontal eminences with transverse groove above eyebrows, depressed bridge of nose, small notched and peggy teeth, and old kerato-iritis with probably occluded pupils. She said she had "cataract taken off" the left eye many years before, and the anterior chamber was very deep when I saw her. Neither fundus could be illuminated. Her sight began to fail at the age of three years.

I do not know whether the conditions present in Mrs. P.'s excised eye were due directly or indirectly to her syphilis, but they were certainly different from any that have come under my notice as the result simply of perforating corneal ulcer. The only specimen in which the choroid and retina at all resembled this one was in a case related by Mr. Cowell at p. 337 of this volume. In that case there was some suspicion of syphilis (hereditary, however, not acquired as here), but the history of failure was very different from Mrs. P.'s, and there was no corneal disease.

I examined her other eye ophthalmoscopically nearly a year later very carefully, and could find no evidence of any disease.

171. *Chronic Irido-cyclitis and peripheral Choroiditis—Secondary Cataract and detachment of Retina—Chronic inflammation of Intra-capsular Cells of Lens—Epithelial changes on front of Cornea—Myopia and commencing Senile Cataract in other Eye—Patient probably remotely Syphilitic—No Arthritic History.*

Anne P., 60, Mr. Hutchinson's patient, came under care in July, 1871, for double cataract; the cataract was more advanced in the left eye and there were iritic adhesions in the same. She considered the left eye to have been failing for about $2\frac{1}{2}$ years gradually. There had been occasional shooting pain in the eye, but no attacks of inflammation. There was no history of arthritic complaints in her family, nor was she herself rheumatic or gouty. She came again in February, 1872, and attended till April.

During the last week of her attendance, the left eye was very painful and she also had a good deal of pain in the right. The condition of the left at this time was as follows: T. +; pupil round, small and probably excluded; iris slightly bulged for-

wards; cataract white and incomplete; a transverse band of superficial roughness of cornea corresponding to palpebral fissure. Excised the same day, April 12.

At that time with right eye she could see 19 when held close; this eye gave myopic refraction at a distance of about 2 feet.

As bearing on the possible cause of the iritis, &c., the following suspicious history as to syphilis is worth recording. The patient has had pityriasis palmaris with fissures on her right hand for 15 years and some eczema on the fingers; there is also slight pityriasis on the left hand. There is no history of secondary disease, and the patient is not aware that she ever had disease from her husbands (married twice). She has had in all four children, the first, by first husband, born at seven months, a boy, died immediately. Her first husband died a few months after marriage and there was then an interval of six years, after which she married again. Her second child, a boy, died at six weeks, but without history of syphilitic symptoms; was a fine child. The next child is living, and reported healthy, æt. 20. The fourth died of "scarlet fever," at three years.

The eye was examined after being hardened for a month in Müller's fluid. The *retina* was detached very extensively, the separation extending far beyond the ora serrata, almost to the ciliary processes in most parts. At the lower and outer part however the retina was still adherent for a short distance behind the ora serrata, and the *choroid* around this patch showed many spots of past inflammation. The opposite surfaces of the retina were pressed together and there was no vitreous. There was a layer of tough greyish tissue upon the hinder part of the *ciliary body* forming a narrow and nearly complete zone. It varied in width a good deal but nowhere exceeded half the breadth (antero-posterior dimension) of the ciliary body. The subretinal space contained clear fluid which, although the eye had been a month in Müller's fluid, gave a copious precipitate on boiling. In the lower part of the anterior chamber there was firmly coagulated translucent material, quite structureless and containing a few very long, highly refracting, probably crystalline bodies, comparable in length, breadth, and gradual tapering at one end to very fine hairs. There was no microscopic change in the *lens*, save that it was blackened by the preservative fluid, as often happens; but microscopical examination proved the existence of

abundant proliferation of the sub-capsular cells all along the front of the lens, while at the equator instead of multiplying they had enormously enlarged so as to simulate in size and form the oval cells of adipose tissue. Beneath the cell layer was an abundantly nucleated stratum having a fibrous appearance and most likely composed of lens-fibres whose growth had been started and development checked by the same inflammatory process which caused proliferation of the intracapsular cells. Beneath this was a somewhat broken layer of large oil or myeline globules and the fibre nuclei of this part were more or less enlarged or contained in dilated cavities. To the central part of the *anterior capsule* many pigment cells and pale lymphoid cells from the iris adhered and it was puckered in some parts. The *iris* looked healthy to the naked eye. The epithelium on the front of the *cornea* was of very irregular thickness, its superficial (squamous) cells being absent almost everywhere except at the margins, while the deep stratum of columnar cells was overgrown in an irregular manner, its individual cells being generally elongated and often much changed in form, club-shaped, pointed, dividing into several processes, &c. There was no change in the anterior or posterior elastic lamina and the posterior epithelium was perfect. The superficial layers of the proper corneal tissue were very finely granular and slightly dim in consequence, contrasting in this respect with the perfectly clear condition of the deeper part, but there were no cell changes.

INHERITED SYPHILIS.

206. *Plastic Iritis travelling backwards to Ciliary body and choroid, and producing thickening of all these structures, greatest in Iris, least in posterior part of the Choroid—Similar inflammation of Vitreous, Retina and Lens—The change of Vitreous, chiefly in its central part, in course of Hyaloid Artery—Retinal Disease least marked at Yellow Spot region—Commencing elongation of rods and cones at many places—Patient probably subject of Inherited Syphilis and aged about 2 years.*

Margaret E. Zapp, æt. 2½ years, was brought to Mr. Hutchinson at Moorfields on April 15, 1872, for iritis of her left eye with some inflammation of the cornea. The mother said that the eye had begun to inflame about three weeks before, having

previously been, so far as she knew, quite well; the other eye had never been affected. One-grain doses of iodide of potassium thrice daily were ordered and atropine drops to the eye. At the end of three weeks, there being no material change, grain doses of mercury and chalk were prescribed once a day, the iodide being continued. The iritis still advanced and there was some bulging in the ciliary region a few weeks after admission. There was never any considerable photophobia. On June 13th (two months after admission), the following note was made:—"Iris very vascular and bulged forwards, considerable congestion of globe, lids somewhat red probably from her rubbing them." It was excised the same day.

Previous History.—Particular inquiry was made with the purpose of finding out whether the child was the subject of inherited syphilis, with the result of establishing a strong suspicion, but no conclusive proof. The mother had been pregnant five times; the first (female), now aged 8 years, was said to have had no symptoms of syphilis in infancy; I afterwards saw her and there was nothing except slight and doubtful puckering at the corners of her mouth to warrant the least suspicion of syphilis. The second and third were miscarriages. The fourth (male) died at six weeks old; it had snuffles and thrush, but no rash on the skin; it was very thin. The fifth was the patient; she had snuffles soon after birth, and a slight eruption "like the measles" (perhaps only infantile lichen) about the buttocks and on the body at about three months old, but had no thrush; her health had always appeared very good. From this history it would seem not unlikely that the four later children were syphilitic, while the first was free from taint, a fact often accounted for by the father getting the disease after marriage. In this case however there was no history of syphilitic symptoms in the father, nor had the mother to her knowledge had any primary disease from him, and she gave no history of secondary or tertiary symptoms. The father was stated to have been a very steady man, and to have lately died of "consumption" at the age of 36.

The left eye was excised June 13, 1872. The cornea was then clear; the iris was swollen and showed numerous very large and tortuous veins. It was examined after being in Müller's fluid for four months; the *sclerotic* was then moderately firm. The *vitreous* was converted into a semi-opaque soft solid, having

much the consistence of jelly; in the centre there was a much firmer part which extended as a cord from the optic disc forwards and expanding into a funnel shape was attached in front at the ora serrata. There was moderate diffuse infiltration of the vitreous with round and multipolar cells; at the central cord these became much more abundant and many were more or less spindle-shaped, the cord itself being composed of beautifully developed spindle cells each with a large nucleus, except where it joined the retina and here the cells were round, or roundly oval, separated by a little highly refracting intercellular substance which remained as a network when the cells were removed; they were continued into the physiological cup and for some distance along the hyaloid on each side of the disc; no vessels entered the new vitreous tissue. The hyaloid also exhibited inflammatory corpuscles and patches of hyaline (probably albuminous) globules. The *retina* was dappled over on its inner surface with very numerous little elevations. At the equator, and for a short distance in front and behind it there were slight folded detachments; all the rest of the retina was *in situ*. The nerve-fibre layer was thickly infiltrated with round corpuscles, like those forming the hinder end of the central cord in the vitreous; indeed the limitans interna could not be made out in many sections the cells near the disc lying both in and upon the retina. There was general thickening of the retina from oedema and oval spaces existed in the intergranular layer. The bacillary layer was normal in some parts, in others its elements were slightly elongated, their inner (retinal) ends being thinned and apparently drawn out. In other parts again the rods and cones were converted into a layer of hyaline globules and granules having no resemblance whatever to the normal structures. The *choroidal epithelium* was in contact with the rods and cones in some sections; in others these structures were separated by a layer of perfectly clear gelatinised fluid, sometimes almost as thick as the retina and containing sometimes numerous oval disc-shaped spaces. As a rule all the above changes were least advanced near the disc and especially on its yellow spot side; indeed, near the latter the rods and cones were healthy. Changes resembling those in the retina were present in the *choroid*, viz., a moderate oedema and scattered infiltration of all its parts with round corpuscles pretty evenly distributed through all parts. The

elastic lamina was normal. The nuclei of the normal spindle-cells of the choroid were all somewhat enlarged. There was but very little pigment in the choroidal stroma. The front part of the uveal tract (*ciliary processes and iris*) were enormously thickened by new round- and oval-celled tissue which, in the case of the ciliary processes, had passed through the pigmented epithelium at various points and converted the *suspensory ligament, ciliary retina*, and *hyaloid* into a thick mass of inflamed tissue swollen by hyaline gelatinised fluid. New blood-vessels were present in this tissue close to the lens and rather behind its equator. The inner (pupillary) part of the iris was in close contact with the *lens-capsule*, in other parts a space of irregular but very small depth intervened. The *capsule* was thickened and puckered at the equator and posterior surface of lens, elsewhere normal; it showed no apertures. Within the anterior capsule was a layer of imperfect connective tissue several times as thick as the capsule with spindle-shaped nuclei, and intervening between this and the *lense-fibres* was a thinner layer of roundish, small, heaped-up cells, probably proliferated intracapsular epithelium. At the equator the intracapsular cells at one side of the lens were much enlarged into egg-shaped and round, highly refracting, nucleated bodies, and these extended for some little distance behind the equator. There were no striking changes in the lens-fibres except enlargement of the nuclei of some among the superficial ones. On that side of the lens where the swelling of intracapsular cells had occurred, a layer of coagulated fluid separated the capsule from the cells. The *corneal tissue* showed slight evidence of proliferation (or at least multiplication) of the nuclei of the corpuscles close to Descemet's membrane, and the *posterior epithelium* was everywhere very distinct and in some parts proliferated; the other parts of the cornea were normal. The front of the iris adhered to the cornea at one spot by a thick pillar of fibrous tissue containing corpuscles; elsewhere there was more or less anterior chamber filled with gelatinised fluid, which contained round or amœboid-looking corpuscles.

99. *Destructive Inflammation of the whole Uveal Tract and Retina in association with Interstitial Keratitis—Keratitis of the opposite Eye—Slight evidences of Inherited Syphilis in the Teeth and Physiognomy.*

The right eye of Peter M., æt. 18, excised by Mr. Couper October 18, 1871. The patient was suffering at the time of excision from very severe interstitial keratitis of both eyes. The cornea of the right eye was very opaque and the eye soft; he was unable to perceive light with it. The left cornea was also densely opaque at its centre and bulging; the eye was not congested. He stated that the left eye had first inflamed seven months before, and that the right became similarly affected about a month earlier. He had much treatment at Hull where he lived, and stated that among other measures scarification of the eyes had been used. There was no evidence in the state of his eyes or in his history that the case had been one of ulceration or of pannus, whereas the condition of his cornæ was just that which is seen in some cases of long-standing syphilitic keratitis. On examining his incisor teeth however nothing *conclusive* of inherited syphilis was found, although they were suspicious; the upper central incisors although of good shape were small, and the lower ones peggy. There was slight puckering of the skin at the corners of the mouth and his complexion had the pallor often seen in the subjects of hereditary syphilis; but still neither of these features was sufficiently pronounced to make the diagnosis certain.

After excision the eye was shrunken and squared and a groove ran round the sclerotic at the equator. Hardened for nearly two months in chromic acid and then divided nearly vertically in the antero-posterior direction. No changes were found in the eye characteristic of syphilis, for the degeneration had gone too far. There was very extensive *detachment of retina* from choroid and of *choroid from sclerotic* with intervening effusions of fibrinous and granular matter, together with several recent blood-clots. The choroidal detachment began a little behind the equator and extended forwards to the ligamentum pectinatum iridis, and was much deeper just behind the lens than elsewhere. The *lens* was shrunken and quite loose in its capsule. The *iris* was in

contact with the cornea in one part; elsewhere the anterior chamber contained coagulated matter.

Family History.—The patient is the youngest of three children. The two elder ones (a brother and a sister) were reported as quite free from symptoms of hereditary syphilis. His mother had been married only once. The patient had never had nodes or ulcerations of the skin and he was not deaf.

INFLAMMATION OF EYE FOLLOWING SMALL-POX, SCARLET FEVER AND MEASLES.

233. *Eye much damaged by Small-pox Ulcer of Cornea ten months before excision—Recent Inflammation—Inflammatory œdema causing slight separation of Choroid from Sclerotic and compensatory plaiting of Retina—Vitreous in early stage of inflammation—Peculiar changes in Rods and Cones.*

Frederick S., 7 years old, had his right eye removed by Mr. Wordsworth on August 17, 1872. At that time he asserted that he had perception of light with it. The eye was much congested and the cornea uniformly opaque and staphylomatous, with a few large vessels near its surface. Its surface also showed two or three pigment dots. Tension was not noted before excision, but half an hour afterwards it was much —. The boy had a bad attack of small-pox about ten months before the above date and his eye became inflamed during his illness; he dated the eye-disease from the appearance of the rash, but was not certain of this.

An equatorial section was made after two months' treatment with Müller's solution. The sclerotic was not well hardened. A thin layer of fluid was effused between sclerotic and choroid, or more strictly among the lax tissue of the lamina fusca, separating the sclerotic and choroid by about $\frac{1}{20}$ th inch (1.25 mm.); this did not extend backwards farther than about half-way between the equator and posterior pole of the eye. Corresponding to the choroidal detachment were several slight separations of the retina taking the form of close folds or plaits beginning at about the posterior limit of the choroidal separation and extending forwards meridionally to join a narrow annular detachment just behind the ora serrata; there were no corresponding folds in the choroid. The foldings of the retina were doubtless produced by

the choroidal detachment which of course diminished the size of the vitreous chamber; the natural elasticity of the choroid allowed it to retain its spherical outline, whereas the non-elastic retina, unable to contract when its contents (the vitreous) diminished, was obliged instead to become convoluted. Neither *retina* nor *choroid* looked thickened to the naked eye. The inner surface of the retina was spotted over with many little whitish elevations probably of the same nature as those on the outer surface of the hyaloid.

The *vitreous* was in a condition of inflammatory oedema; it became opalescent, brittle and gelatinous in Müller's fluid, changes which indicate albuminous infiltration; and it contained in all parts (the hyaloid and the centre of the vitreous also) a considerable sprinkling of inflammatory cells. The outer surface of the *hyaloid* was also mottled with little opacities consisting of hyaline globules (having the same refraction as colloid material) which were I believe some form or derivative of albumen. These bodies are extremely common in eyes recently inflamed and hardened in Müller's fluid. Microscopical examination showed changes in the *retina* and *choroid* indicative of early inflammatory oedema. The *choroid*, both around the disc and at the equator, was about twice its normal thickness and the chorio-capillaris infiltrated with round lymphoid cells. There was no change in the epithelium or elastic lamina. The thickening affected the chorio-capillaris and the deeper parts equally. The *retina* was not much altered in thickness, but its cells and fibres were rendered much less distinct than is normal, partly by swelling and close mutual apposition (as was the case with the cells of the granule layers which had even become polygonal by mutual pressure), partly by infiltration of structureless highly-refracting substance (albuminous fluid) between the nerve-fibres and among the nerve-cells. The fibres of Müller and the rod and cone fibres were thus almost entirely obscured. There were no inflammatory products in the nerve-fibre layer or in the sheaths of the retinal vessels, but oval and roundish cells of doubtfully inflammatory origin were present outside the central vessels of the *optic disc*; these may have been only the over-fed nuclei of the tissue itself. I could find no swollen nerve-fibres in the disc or neighbouring retina, the fibres being merely separated from each other by fusiform and oval spaces. The

most notable changes had however occurred in the *bacillary layer* in many parts of the retina. It is to be noticed that these were most marked at those parts where the greatest macroscopic change was observed, while at the posterior pole of the eye where no separation of retina from choroid or of the latter from the sclerotic had occurred, the rods and cones were perfectly normal, although even there the changes described above in the other retinal structures were present. Thus, assuming that the patient's statement as to perception of light was correct, it would well accord with the condition of the receptive parts of his retina at and about the yellow spot. The *rods and cones* at a short distance to the nasal side of the disc were elongated so as to equal in some parts almost a third of the thickness of the retina; the change affected all the rods and cones of any one part about equally, so that none projected to any great extent beyond the rest; here and there however one could be seen shorter than its fellows. This increase in length appeared to have taken place at both ends of the cones, so that while the inner end of each no longer rested on the *limitans externa* the outer (filamentary) part was considerably longer than it should be and terminated by a slightly bulbous swelling. The two parts of each cone often preserved their normal diameters, although when the change had gone a little farther the inner (bulbous) portion was generally swollen, having lost its regularity of outline and become variously distorted, so that the conical shape might even be reversed. Connecting the base of the cone with its granule was a foot-stalk or neck consisting of highly refracting, perfectly hyaline substance; it was sometimes nearly equal in length to the bulbous part of the cone, but generally not more than half that length; its thickness varied much in different cases, being sometimes as thin as the filament portion of the cone and in other specimens nearly as thick as the bulb itself. This new peduncle was also often more or less bent, and its distortion, high refractive index, and varying diameter gave it some resemblance to a bit of glass tube which has been clumsily drawn out and bent while hot. In the rods no proof could be given of the elongation at their inner ends, although it probably existed. At a later stage the hyaline foot-stalks of the altered cones and rods became longer, and at the same time thicker, more irregular and more or less fused together, while the bacillary elements them-

selves swelled up into globular or flask-shaped masses with the refraction of myeline. In all parts, even at the yellow-spot region, there was a thin layer of perfectly structureless substance (coagulated albuminous fluid) between the bacillary layer and the choroidal epithelium, and much of the pigment of the latter often adhered to the rods and cones being widely separated from its own cells. In many sections spherical bodies were seen in great numbers lying close to the outer ends of the rods and cones imbedded in the coagulated effusion just mentioned. These spheres were very finely molecular or almost homogeneous, of waxy or myeline-like refraction, and varied in diameter from that of one to two red-blood corpuscles; they were colourless. I have no doubt that these bodies, which are I believe well known to all who have examined diseased eyes, are derived from the rods and cones, for in many parts separate cones or rods were seen swollen at their outer ends into flask-shaped or globular beads of different sizes and with varying portions of the filament still intact, while others, lying perhaps close to them, were quite devoid of any remnant of the rod or cone. They closely resemble the changes which occur in the bacillary structures when chromic acid is used for hardening the eye, and are probably of the same nature, being produced partly by swelling of the rod or cone from imbibition and partly by the gradual shortening of the thin filament and its conversion into a sphere. In this and similar specimens however that the changes in question are undoubtedly the results of disease is evident enough. A section of the retina at the equator, and including one of the plaited detachments described above, showed less of the elongation and more of the terminal swellings in the bacillary layer than in the parts near the disc; no special change had taken place at the retinal folding, except the distortion and crowding of the rods and cones which was inevitable.

230. *Perforating Ulcer of Cornea after Small-pox—Excision four months later—Commencing Inflammation of Vitreous—Effusion of Fluid between Sclerotic Choroid and Retina.*

The left eye of John P., 12, Mr. Streatfeild's patient. He had small-pox severely four months before admission and was much scarred by it. The eye did not inflame till after he had

got up and was well enough to play about ; his mother confirmed this account. When admitted, August 12, 1872, the left eye was much congested and the whole cornea irregularly staphylomatous, at places very thin and showing black iritic pigment through it. He had distinct perception of light with it. Excision was done the same day, and the eye placed for two months in Müller's fluid, and then examined.

The *sclerotic* was not well hardened by the preservative. There was a tolerably thick and uniform layer of fluid between sclerotic and choroid, or rather among the cells of the lamina fusca, extending forwards as far as the attachment of the ciliary muscle, and a much thinner layer between retina and choroid. As is usual in such cases, the *choroid* had preserved its spherical outline, but the *retina*, not being so elastic, had accommodated itself to the diminished volume of the vitreous by the formation of meridional folds with closely applied sides, which passed from near the ora serrata backwards beyond the equator but not as far as the disc ; near the ora serrata they became continuous with an equatorial fold of detachment which encircled the eye. The hinder part of the retina was *in situ*. The *lens* was absent, its place being occupied by coagulated matter of somewhat spongy consistence from the presence of numerous little spaces in its substance. There was a central anterior synechia ; the rest of the iris was thickened. The *vitreous* showed signs of albuminous infiltration (œdema), being converted into a softly gelatinous, brittle, nearly opaque substance, like soft apple-jelly. The *hyaloid* separated with great ease from the retina, retaining the depressions caused by the foldings of the latter ; its outer surface was thickly dappled with small, whitish, ill-defined, slightly raised spots, and was also uniformly hazy ; the spots consisted of clumps of hyaline albuminous (or colloid ?) globules, and the general haze was due to a thick sprinkling of large round or multipolar inflammatory cells, distributed almost uniformly, but sometimes slightly aggregated beneath (*i.e.*, on the *hyaloid* surface of) the heaps of clear globules above mentioned. The same cells were present in considerable numbers throughout the vitreous ; they mostly contained one nucleus, but sometimes two.

182. *Perforating Ulcer of Cornea after Small-pox—Early Stage of Inflammation of Vitreous—Slight Fluid Effusion between Sclerotic and Choroid, and between Choroid and Retina.*

The right eye of Louisa G., 20, excised by Mr. Streatfeild, April 29, 1872; the eye was then painful, and immediately after excision looked slightly shrunken. She had been attending for a month with "staphyloma of cornea following ulceration after small-pox."

After five months' hardening in Müller's fluid, the *vitreous* was found to contain a number of opaque streaks which all radiated from a single point of origin between the lens margin and two or three neighbouring ciliary processes, as if after a wound. The rest of the vitreous was but very slightly, if at all, changed in consistence or naked-eye characters; perhaps slightly gelatinous. The *hyaloid* separated very easily from the retina and was dappled over with little white spots; these consisted of well-formed pus cells in great abundance and patches of pale, faintly cloudy matter in irregular granules, among which were a few small, round cells, like red blood-corpuscles. Some large amœboid cells were also present. The opaque streaks in the vitreous were composed solely of pus and some fibrinous threads; sections through the parts in the ciliary region from which these streaks radiated showed free suppuration of the *ciliary processes* with loosening and diffusion of their epithelial pigment cells in the most anterior part, and inflammation of the *iris*, with a thick layer of pus on its posterior surface which was continuous with that produced by the ciliary processes. The *ciliary retina* and *hyaloid* were full of pus in the same sections. In the corresponding part of the *cornea* were numerous groups of pus corpuscles, collected in enlarged corneal corpuscles. The *ciliary muscle* was free from purulent infiltration, although somewhat swollen and its fibre-bundles opened up. The relation between the suppurating part of the uveal tract and the corneal perforation was not ascertained.

There was slight separation of choroid from sclerotic, and of retina from choroid by fluid. The *choroidal detachment* was, as usual in such cases, uniform and without puckering; the *retina* on the other hand was raised into plaits which projected towards the vitreous and passed from the ora serrata, where there was a

narrow complete zone of detachment, backwards; none of them reached so far as the optic disc. The *choroidal epithelium* very easily separated in flakes, leaving a pale grey surface exposed, the *choroid* proper being somewhat thickened and paled in colour at the equator, probably by purulent inflammation. The *lens* looked healthy to the naked eye.

233. *Perforating Ulcer of Cornea after Small-pox—Loss of Lens and Vitreous—Excision one month after perforation of Cornea. Detachment of Retina, fibrous thickening of Choroid—Cholesterine in subretinal space—Eye previously “weak.”*

The right eye of Dennis B., 47, an Irishman, excised by Mr. Hutchinson, August 1, 1872. Seven weeks before excision he had small-pox; the eye was affected quickly after the rash came out, and “the sight fell out one morning on to the table before him,” about a month before excision. He had much pain till “the sight came out,” but it ceased soon after that. The other eye was normal throughout. The right (lost) eye had been more or less “weak” for four years past, since he got some lime and gravel into it; “being a weak eye, I suppose the pock pitched in it.”

The eye was much shrunken, and scarcely any cornea was left. There was neither lens nor vitreous, the retina being detached and shrunken. The subretinal space contained fluid, in which there was a good deal of cholestearine. The choroid was much thickened by tough white tissue.

111. *Staphyloma of Cornea after Small-pox Ulcer.*

One eye of Harriet J., 13, excised by Mr. Hulke, November 18, 1871. At the time of excision the cornea was staphylomatous, and it burst during excision, allowing most of the contents of the globe to escape. A cursory naked-eye examination detected no disease of *retina*, *choroid*, or *ciliary body*. The *lens* and *vitreous* had escaped. The girl had small-pox five months before excision; it was tolerably severe, and left many moderate pits on her face. The eye inflamed about two days after the rash came out and never recovered. She was vaccinated in infancy and showed two well-pitted scars on her arm; no re-vaccination had ever been done.

141. *Eye lost by Corneal Disease after Scarlet Fever, 10 years—*
Irritability of other Eye 9 months—Thin layer of bone on inner
surface of Choroid.

The left eye of George W., 19, excised by Mr. Streatfeild, February 5, 1872. It was lost gradually, probably by corneal ulcers, soon after scarlet fever 10 years before excision; he was weak and out of health at the time, and the other eye was inflamed at the same time but got well again. The right eye had been subject to attacks of dimness and redness for about nine months before he came under care, but no permanent damage had resulted. In the lost eye a large thin concave *plate of bone* surrounded the optic nerve on the inner surface of the choroid and at one part reached forward to the ciliary body. In all probability it was the formation of this bone which had set up the sympathetic irritation in the other eye. The *lens* was calcified, being hard on the surface and mortary within. *Retina* detached; cholestearine in subretinal space. *Lens capsule* appeared to the naked eye semi-opaque but not calcified.

189. *Eye Inflamed during Scarlet Fever 11 years before excision*
—Sight lost gradually but not completely till after a blow 4
months before excision—History of many relapses of Inflam-
mation since the first failure—Chronic Connective-tissue Hy-
pertrophy of Choroid and Retina—Atrophic Cupping of Optic
Disc—Old Subretinal Effusion, with partial detachment of
Retina—Commencing Ossification in Choroid close to Disc—
Recent Blood in Anterior Chamber, Vitreous, &c.

Philip H., 21, Mr. Lawson's patient, had "scarlet fever" severely when 10 years old; he was in bed three or four months and was expected to die, passing blood from the bowels. He had a red rash, which his medical man called scarlet fever. His right eye inflamed during or very soon after the above illness and remained always afterwards liable to relapses of redness and pain from very slight causes. He believes he could see shadows with it till Christmas Day, 1871, when it was injured by a severe thrust from a fellow-servant's finger. There was much swelling and "blackness" of lids after this injury. When he came to the hospital, on May 7, 1872, there was blood in the lower part

of the anterior chamber, pupil large, and apparently the iris was deficient at the upper part, as if after iridectomy; no operation had ever been done, and the appearance was probably due to retroversion of that segment of the iris from the blow. The area of the pupil was yellowish and opaque. The patient was a florid man with dark hair. Mr. Lawson excised the eye at the same date and made a cursory examination of it at once after opening it in the antero-posterior direction directly after excision.

The pupillary margin of the *iris* was adherent to the lens-capsule from past iritis. The *lens* itself was soft and semi-opaque, and had patches of yellow dense opacity in various parts, chiefly peripheral. There was much diffused blood in the *vitreous* which evidently came from the ciliary body, in whose neighbourhood it was most abundant and partly coagulated. The vitreous itself was tough in front and contained there many spindle-shaped inflammatory cells; behind it was fluid. There were several folds of *retinal detachment*, chiefly in front, as if caused by the dragging of inflamed and contracting vitreous; elsewhere it was *in situ*. Its veins were much gorged with blood. The most peculiar feature was the presence of numerous whitish yellow dots, apparently in the retina; they covered almost all its lower half, but extended also above the disc; in many places they had coalesced into almost uniform areas of dense opacity. These white patches were all beneath the retinal vessels. Further examination, after the eye had been hardened in Müller's fluid and alcohol, proved that the greater part of the white deposit was *between retina and choroid*, where it formed a layer, absent in some parts, and of varying thickness, but nowhere thicker than the retina. This effusion was composed chiefly of dark-coloured compound granule corpuscles (stained partly by the preservative fluid, partly perhaps by blood), imbedded in a finely granular, structureless matrix (coagulated albuminous fluid), and mixed with a good many free red blood-corpuscles and a few lymphoid cells, probably white blood corpuscles. There were also a number of small white granules, quite visible to the naked eye and consisting of crystals resembling those of triple phosphate, of which they were probably composed. On making sections of the *retina* its bacillary and outer granule layers were found to be entirely replaced in many parts by masses of the same rust-coloured granular corpuscles as were present between retina

and choroid; many of them were nucleated, and the nuclei often coloured more deeply than the rest of the cell; similar corpuscles and coloured (blood) granules were present in some parts of the hyaloid. In all sections every part of the retina was thickly strewn with new cells bearing a general resemblance in size and shape to those of the inner granule layer, but often a good deal larger and of various elongated forms. The individual fibres of Müller were thickened. There was hardly a trace of the bacillary layer, only here and there two or three cones or rods. At the *disc* the nerve-fibres were very highly atrophied, and a deep cup with very steep but not overhanging sides was the result. The *retina* at a distance from the disc in the lower part of the eye was increased in thickness from twice to three times, but in other respects resembled the part already described. The *choroid* was also much thickened in all parts, except close to the disc where it gradually assumed nearly its normal dimensions. The increased growth had occurred in all parts from the chorio-capillaris to the lamina fusca; in the former part the new tissue consisted of colourless spindle-cells or fibres, with large nuclei and loosely packed together; while in the deeper parts the pigmented multipolar cells were increased, both in size and number, and had produced a very abundant network of fine, separate, highly refracting fibres which did not curl up if broken, but in other respects looked like elastic tissue. At the choroidal rim of the optic disc a narrow ring of finely fibrous tissue with closely packed nuclei had grown in the chorio-capillary layer to a thickness of from two to three times that of the normal choroid; on one side of the disc its deeper half or two-thirds was ossified, on the other side it contained no bone. The elastic lamina and a few epithelial cells could be traced over it. The epithelium of the choroid generally was nearly normal, its cells being perhaps a little enlarged and rather ill-defined; here and there it had undergone proliferation; the new cells had grown to gigantic proportions and had developed a uniformly and finely granular substance in their interior which was arranged so as to produce an appearance of thin short lines radiating from the central part of the cell. These large cells contained very little pigment.

160. *Incipient Detachment of Retina by the contraction of a Fibrous Vascular Band traversing the Vitreous—Eye Lost 13 years before excision by Perforating Ulceration of Cornea.*

The right eye of Anne F., 16, Mr. Lawson's patient, excised March 12, 1872. The cornea was opaque everywhere and flat, and the eye after excision found to be very slightly shrunken. Both eyes were severely affected when she was three years old, after having "scarlet fever and measles;" the right was lost, and the left much damaged by large corneal opacities which were present when right was excised. The right had rarely given her much pain, but it had lately been more painful than usual, and the left had sympathised by becoming intolerant of light.

After hardening in chromic acid a vertical antero-posterior section was made to the inner side of the optic nerve. The *vitreous* was for the most part fluid, but in front it was too stringy, although not opaque. *Stretching across the vitreous* chamber was a thin but *tough string*, attached behind to the retina, at and close to the disc, by an almost tendinous expansion. In front the shreddy portions of the string near the ciliary body were freely scattered with large corpuscles, some round, others multipolar.

The part of the retina to which the hinder end of this cord was attached had become split into two layers, the outer being in normal contact with the choroid, the inner forming a hollow cone whose apex was continuous with the vitreous string above described. Vertical pillars joined these two layers of the retina. From the foot of the fibrous cord various bands of thickening passed in different directions into the retina, and there were also some strings in the front of the vitreous. The rest of the retina was *in situ*.

A *microscopical examination of the cord* traversing the vitreous showed it to consist partly of fibrous tissue with large branching cells, and partly of a longitudinally fibrous substance devoid of cells or nuclei. It was attached to the optic disc, which it entirely covered. The retina all around its base was thickened and contained an unusually large number of blood-vessels; many of these passed for a short distance into the cord and one was traced through about half its length. The last-named vessel was a very large one and was directly continuous with one of the main central vessels of the optic nerve. As before

stated, it could not be traced further than about half the length of the cord, ceasing to be visible where the latter became very thick and opaque, while in the thin membranous anterior expansions of the new tissue no vessels were visible, although a careful search was made. No inflammatory (corpuscular) elements were present in any part of the fibrous cord, and it was only where it became continuous in front with the hyaloid membrane that the cells already described in the latter made their appearance. The *retina* (except the thickening of its nerve-fibre layer above mentioned) showed no obvious changes near the disc, all the strata being easily recognised, including the rods and cones. There was some heaping up of choroidal epithelium near the edge of the disc but no striking changes in any other layers of this membrane. The *lens* was absent; its *capsule* was thickened and, together with the iris, adherent to the central part of the thickened cornea.

135. *Kerato-Iritis, said to have followed Measles, one Eye becoming blind 13 years before excision—Sclero-Corneal Staphyloma 2 years before excision—Pupil excluded and occluded—Lens shrunk—Optic Disc cupped—General thinning of Sclerotic and Cornea.*

The left eye of George F., 30, excised by Mr. Bowman, May 7, 1872. At the date of excision the upper part of the cornea was very staphylomatous, the protrusion occupying two-thirds of the circumference and involving the sclero-corneal junction. The cornea was smooth, but a broad band of haziness nearly crossed it horizontally and its margins were nebulous. The iris was brown and drawn slightly backwards to the pupil, which was very small, occluded, and drawn somewhat upwards. In the other eye the cornea was nebulous and pupil almost closed; the corneal opacities were partly marginal, like arcus, partly central. V with this eye was 8 J.: T. n. He stated that both eyes had been inflamed after measles in infancy, and he could never remember to have seen well. Thirteen years before excision the left eye inflamed, and in about six months became quite blind; it seemed probable from his medical attendant's statement to him, that the staphylomatous condition was not of more than two years' duration at date of excision, and until a short time

before the latter operation the eye had not troubled him ; it then became painful, and remained so till removed. Sixteen years before excision the same eye was operated on for squint. The other eye had also suffered a relapse of inflammation about six years before admission, several years after the left had become quite blind.

The eye was examined after hardening for two months in Müller's fluid, and I am indebted to Dr. Buller for much of the description. Its antero-posterior diameter was not increased. There was complete exclusion of the pupil, the pupillary margin of the iris being firmly adherent to the lens-capsule, while its peripheral part was bulged forwards and outwards by fluid which had enormously distended the posterior chamber, and in addition had caused the bulging and attenuation of the tissues at the corneo-scleral junction ; these changes were most advanced at the upper part. The central part of the anterior chamber was deep, the margin shallow. There was deep *excavation of the optic disc* at its inner side. The *cornea* and *sclerotic* were both uniformly and moderately thinned. The *lens* was shrunken equatorially and consequently too convex ; there was compensatory elongation of the suspensory ligament, this structure being everywhere intact. *Microscopical examination* showed the central part of the *iris* firmly attached to the front of the lens capsule by wavy, fine fibrous tissue. The capsule itself was quite normal, and the only decided change in the *lens* was the existence of very large oval cells, or cell-like bodies, within the posterior capsule near the equator ; they resembled the nucleated ends of lens-fibres in refraction, but were much larger, contained no nuclei, and were not seen to be continuous with fibres. They differed from the myelin-like globules which exude from swollen lens-fibres.

RHEUMATIC INFLAMMATION.

181. *Chronic Irido-Cyclitis, leading to formation of Opacities in Vitreous—Secondary Cataract (and in one Eye Detachment of Retina). Delayed Symmetry—Some of the Symptoms simulating Glaucoma—Excision and Dissection of one Eye—Cause of Disease probably Rheumatic.*

Richard G., 60, first came to the hospital in February, 1867, under Mr. Dixon's care, on account of his right eye, the diagnosis

written on his letter being "cataract in right, detachment of retina, and floating bodies in vitreous." He attended till September. In February, 1870, he again came to the hospital, under Mr. Hutchinson's care, complaining of the other (left) eye. The lens was slightly opaque, the retinal *veins* pulsated, and he complained of seeing halos round flames. At a later date (October) the notes state that the above symptoms continued, the tension being doubtfully a little increased and the vitreous full of floating bodies. The pupil was active, there was no cupping of the disc, and no inflammatory symptoms. The *right* eye at this time showed a complete, chalky looking cataract and contracted pupil; after atropine the latter dilated and several posterior synechiæ came into view.

History.—He states that the right eye first failed a short time before he first came to the hospital; it was "blood-shot," but he does not speak of pain as one of the symptoms. There is no satisfactory history of any constitutional cause for failure of his eyes, but this may not improbably have been due to the arthritic diathesis, for he has decided evidences of chronic rheumatic arthritis in the presence of bony lips on his femoral condyles; he appears however never to have had any marked symptoms of rheumatism. He denies having had any kind of venereal disease and shows no signs of tertiary syphilis; and his only child presents nothing suggestive of the inherited disease. At the date of excision the right eye was quiet, the pupil small and round and occupied by a chalky looking cataract, the iris blue. It was excised by Mr. Streatfeild (in Mr. Hutchinson's absence), April 29, 1872.

The specimen was cursorily examined at once, and again more carefully after treatment with Müller's solution. The retina was found detached in funnel shape, and shrunken so as quite to obliterate the posterior half of the vitreous chamber, while the front half was much reduced. The detachment in most parts extended considerably beyond the ora serrata. The retina was still nearly transparent. The subretinal fluid had unfortunately escaped through a small hole made during excision and could not be examined. There were very numerous small elevations on the choroid in front of the equator ("colloid" bodies), still uniformly covered by epithelium; in the neighbourhood of the ora serrata there were a few patches of irregularity of epithelium,

but elsewhere there were no naked-eye changes in the choroid. The vitreous, very small in quantity, was tough and stringy, and still tolerably clear; the hyaloid was firmly adherent to the retina, and consisted entirely of cells either round, multipolar with fine processes, or spindle-shaped. At the centre of the vitreous, near the back of the lens, a fine cord projected backwards towards the disc, though it could not be traced so far as that part; it was composed of modified spindle-cells, much elongated, somewhat fused together, and at the same time stiff and brittle (after treatment with Müller's solution). There was a patch of recent blood as large as a mustard seed, and consisting of well-formed corpuscles, close to the back of the lens; there was also a great deal of dark brown pigment near the back of the lens, especially near its posterior pole, and about the axial fibrous cord described in the vitreous. The pigment was partly in fine granules scattered or more or less aggregated; partly collected in the cavities of numerous compound granule corpuscles of various sizes, and containing well-marked nuclei; partly (but to only a small extent) in the interior of the spindle-shaped cells of the vitreous and hyaloid. Probably all this pigment was derived from old hæmorrhages. No distinct evidence of blood-vessels could be made out in the vitreous, although they were carefully searched for. Sections of the *lens* (not including its capsule, but containing some of its intra-capsular cells) disclosed fatty degeneration of many parts with great hyaline swelling of many of the intra-capsular cells. The fat globules, often of large size, formed strata of varying thickness in the superficial layers, the nucleus of the lens being quite free from this change; in one place near the equator a double rift had occurred, enclosing a wedge-shaped portion of lens-structure whose *central* part alone had undergone conversion into fat globules, probably because it was furthest from nourishment. A layer of homogeneous clear (probably albuminous) effusion was present immediately beneath the intra-capsular cells in many parts, and immediately upon the most superficial layer of fibres a thick deposit of variously sized oil-globules had taken place. The nuclei of the deeper equatorial layers were often enclosed in larger chambers filled by clear hyaline substance, and somewhat resembled in appearance cartilage cells.

207. *Relapsing (Rheumatic) Iritis in each Eye—One Eye ultimately lost by Irido-Cyclitis and Diffuse Choroiditis (chiefly of anterior part of Choroid)—Hæmorrhage between Choroid and Retina—Plastic Inflammation and great Thickening of Iris and Ciliary Body with passage of Embryonic Connective Tissue through apertures in Lens-Capsule—Patient the subject of Chronic Rheumatic Arthritis.*

Mary T., 53, Mr. Critchett's patient, stated that her first attack of eye disease occurred 12 years previously, in the right eye (the one afterwards excised); it was attended by pain and dimness. A second and similar attack came on 5 years later, and a third 4 years after the second. The third ended in total permanent blindness. The left eye was first affected about when the third attack happened to the right; it was not painful at that time, however. At the date of admission, June 14, 1872, the right eye had again been inflamed and very painful for three months, and it is probable that the corneal opacity came on at this time, for she said that until this attack the blind eye looked externally just like the other and was not "white" till quite lately. A similar attack occurred to the left eye a month before she came to the hospital and this time it was accompanied by much pain. Vision was much damaged during this attack; on admission she could not distinguish one person from another; there was closed and excluded pupil, iris bulged forward, ciliary sclerotic thinned, and T. —. Iridectomy was performed.

Condition of right Eye.—Cornea densely opaque at centre and extensively hazy elsewhere, its margin remaining very nearly clear except at inner part; at the same part its surface was slightly roughened, elsewhere being smooth. Iris of a curious tortoiseshell colour and pattern, being abruptly patched with black, buff-yellow and a little white. Slight congestion of globe. Excised same day.

History of Rheumatism.—For 15 years she has been liable to rheumatism in various joints and the loins, chiefly in left ankle, left ring finger (which has become partly stiffened in consequence), and in knees. The left ankle is now weak, and there is decided grating in the right knee. She has been laid up several times by the rheumatism; the first attack was in the left ankle, and she attributed it to having lived on a damp, brick-

paved floor. Her mother used to have "rheumatism" in her hands; they used to "swell up." No other family history of arthritis in the family. The patient is married but has never been pregnant.

The right eye was placed for four months in Müller's fluid, when the sclerotic was well hardened. The *retina* was found detached and much shrunk, the subretinal space being full of coagulated blood and albuminous fluid, the latter converted into a solid mass resembling in consistence apple jelly. The *choroid* was everywhere more or less thickened, apparently by infiltration with similar coagulated serous fluid; this change was most advanced in front, gradually diminished from before backwards, and was least developed close to the disc. The choroid was not examined microscopically. The whole choroid adhered somewhat too firmly to the sclerotic. The *iris* was in contact with the cornea, much thickened, and apparently adherent all over to the lens capsule. The *lens* was too convex from equatorial shrinking, and contained irregular streaks of opacity.

Microscopical examination showed that the thickening of the *iris* was due to its conversion into a sort of granulation tissue in various stages of development and covered in front by two or three rows of long, spindle-shaped cells or fibre-cells, probably remnants of the muscular layer; this surface was in close apposition with the epithelium of Descemet's membrane, a few cells of which were seen here and there. The deep layers only of the cornea were examined, and showed no change. The chronic inflammatory process involved the *whole ciliary body*, and to a less degree the overlying sclerotic. The ciliary process was not recognisable as such, being converted into a mass of round-celled structure. In the part corresponding in position to the *ciliary muscle*, the new cells were much more separated from each other by a hyaline, dimly fibrous, wavy, intercellular substance. The *lens capsule* showed numerous very evident striations, parallel with its surfaces; it was probably a little thickened, and in parts was puckered. In two or three places near the equator, on one side (the other side not examined), the *capsule showed apertures* the largest of which was equal in width to about twelve times its thickness; their edges were in all cases more or less bevelled off. These holes in the capsule were filled by cells continuous with those in the ciliary process or iris; they

passed into the capsule and spread far and wide on each side of the entrance. The cell elements of the inflamed tissue close to these capsular openings were larger, more closely packed, and less clearly defined than those in other parts of the iris, &c., and the same description applies to those filling the holes and lying within the capsule. Many of them were very large and provided with irregular amoeboid processes, and they bore some resemblance to the cells of a giant-celled sarcoma. None of the proper intracapsular epithelium was seen, but in its place on the front of the lens and at a distance from the apertures, there were long spindle-cells or fibres with granular contents, probably incipient connective tissue derived from the new cells which had gained access through the holes in the capsule. There were many large tracts of distorted and ruptured lens-fibres and spaces filled with myeline globules and broken fibres; some of these were probably *post-mortem* changes, but they were much more abundant than is usual from the mere action of preservative fluids.

116. *Glaucoma with slight Iritis in one Eye—Commencement of Symptoms eight months—Eye Blind three months—History of Rheumatism in patient and her father.*

Sarah G., 43, was under Mr. Streatfeild's care, December 11, 1871, at which date her right eye was excised. She said that she had begun to see colours around objects with this eye about eight months before. She had since then suffered a great deal of pain in the eye, and it had been quite blind for three months before excision. At above date right eye T + 2; no perception; cornea steamy; scleral congestion chiefly ciliary; posterior synechiæ. Cataract chiefly posterior. Left eye, vision $1\frac{1}{2}$ Snellen; hypermetropic.

The eye was hardened for 24 hours in chromic acid, and divided transversely. There was nothing of special pathological importance visible to the naked eye. The *disc* was deeply cupped, the posterior surface of the *lens* showed a streaky, spermaceti-like opalescent appearance, but was not quite opaque; the deeper and anterior parts appeared transparent. The *iritis* had been only slight, judging by the readiness with which the synechiæ broke down; there was no membrane across the pupil, nor any visible lymph on the posterior surface of the iris; some pigment remained on the lens capsule.

The *vitreous* showed no naked-eye changes, with the exception of recent blood effused into it in two places, from the centre of the disc and from the hinder part of the ciliary body at the lowest part of the eye. The blood was quite fresh. That from the optic disc projected about $\frac{1}{16}$ inch (2.5 mm.) straight forwards into the vitreous. Probably, as Mr. Streatfeild suggested, the bleeding occurred during the squeezing to which the eye was necessarily subjected while being excised, its tension being already much increased. A somewhat cursory examination under a magnifying power of 30 diameters failed to detect any ruptured vessels in either situation.

Eight years before admission this patient had a severe attack of "rheumatic fever," which laid her up for four months; before that and since she had been liable to aching in her joints. She had small-pox when 16 years old. Her father was stated to be often laid up by rheumatism in his knees.

122. *Eye lost gradually in 4 years by (recurrent?) Irido-Choroiditis—Secondary Glaucoma—Excision 16 years after it became Blind—Other Eye never affected—Anatomical Changes—Old disseminated and equatorial Choroiditis, old Retinitis with pigmentation, closed Pupil, absorption of Lens, excavation of Optic Disc—Cause of Eye Disease doubtful, Syphilis or Rheumatism—Suspicious history of Secondary Syphilis when Eye first failed—Definite history of Chronic Rheumatic Arthritis in patient and near relatives, and abundant evidence of articular changes caused by it in patient.*

As the morbid appearances found in this specimen are of considerable interest, more especially those in the choroid, and led me to expect that the woman was remotely syphilitic, I will record as much of her history as I was able to get. For many years she had been subject to chronic rheumatism, chiefly in her knees, never however bad enough to lay her up. At the date of admission there were large lips on her femoral condyles, loose or pedunculated bodies in the knee joints, and grating on movement. She said that most of her children and both her own sisters had suffered from "chronic rheumatism." She did not know of any gout or rheumatic fever in the family. The evidence of syphilis was slight. Twenty years before admission

she had a bad "ulcerated throat on both sides," "a quincy," and at the same time had a severe eruption on the head and fronts of elbows. This rash, however, she had been subject to for years before the sore throat. She never again had such a bad throat as the one referred to. I asked her directly about the primary disease, and she was not aware that she had ever caught anything from her husband. There was not any history of suspicious symptoms in her children. It was at about the time when she had the ulcerated throat that her right eye began to fail. It gave her some pain, and was inflamed. The failure of sight was gradual, and it was not till four years later that the eye became quite blind (*i.e.*, sixteen years before excision). This history is much more like that of recurrent iritis followed by glaucoma than of syphilitic iritis. At the date of admission, December 15, 1871, I examined her *left* eye with the ophthalmoscope (with undilated pupil), and could find no evidence of disease. Condition of *right* eye at the same time, T. + 2, commencing ciliary staphyloma, pupil small and excluded, cornea rough and an arcus senilis at its border; excised the same day. The right eye was excised December 15, 1871, and after one day's hardening in chromic acid was divided vertically from behind forwards to the inner side of the optic nerve. There was deep excavation of the *optic disc*. The *retina* was *in situ* everywhere. There was extensive old disease of the *choroid*, especially at the equatorial region; this consisted for the most part in numerous highly pigmented dots of various sizes, none larger than a small pin's head, but there was also a very large patch of almost complete atrophy of the choroid extending from the upper part of the equator downwards and backwards on the nasal side and showing the white sclerotic through it. The retina closely adhered to many parts of the diseased choroid. The *microscope* showed in the *retina* and *choroid* advanced atrophy, evidently consequent on inflammatory changes; the bacillary layer was absent everywhere; the nerve-fibre and nerve-cell layers were much atrophied, the former being represented by a thin stratum of fibrous structure, and the latter often replaced by small round spaces filled with almost homogeneous substance (albuminous effusion into nerve-cell spaces?). The connective tissue of the retina was much thickened in all its parts, and the *limitans externa* was often replaced by quite a thick layer of fibrous tissue. Much choroidal

epithelial pigment had passed into the retina, and some was still close to the outer surface as if stopped in the act of being pushed or drawn inwards. Some of the pigment surrounded the retinal vessels, both large and small ones, in all parts of the retina, but the majority of it was in the form of separate, spherical, brown masses a little smaller than choroidal epithelium; that around the vessels was composed of the same round masses, but heaped together, more irregular and of darker colour, as if the fluid had been abstracted from several of the brown globular elements and the pigment of them all had become more or less fused together. The *choroid* was everywhere more or less atrophied. At the large white patch above mentioned scarcely anything except the elastic lamina remained; in other parts, except in the equatorial region, the epithelium was generally pretty regular, the elastic lamina was thickened to twice its normal dimensions, and here and there a "colloid" pedunculated growth projected from it into the retina; the vascular part of the choroid was so atrophied in all parts as only to equal in thickness the epithelial and elastic strata. Another change of importance was *detachment of the hyaloid* as far forwards as the ora serrata, so that it formed in that situation a thin transparent diaphragm across the eye. The sub-hyaloid space contained a coagulated albuminous fluid with fatty or perhaps calcareous granules in small number. The *lens* had been completely absorbed, its capsule remaining in an opaque and partly calcified state; the anterior layer was inseparable from the fibrous membrane which glued it to the pupillary edge of the iris. The *iris* was in contact with the cornea but not adherent to it; with the exception of the new fibrous tissue at its pupillary border it looked healthy to the naked eye.

GLAUCOMA.

173. *Glaucoma said to have followed a blow—Iridectomy, without relief of symptoms, three weeks after commencement of disease—Excision six weeks later—Early stage of Inflammation of Vitreous—Retinal Hæmorrhages—Disc not cupped.*

Catherine D., æt. 44, Mr. Couper's patient, was admitted on March 5, 1872, with glaucoma of her left eye. The symptoms had been present three weeks, and she said that they had begun the day after she received a blow on the eye from a child's fist. The

symptoms were T. + 1, shallow anterior chamber, steamy cornea, bulging iris, great pain; the fundus could not be illuminated. She had perception of light with the eye. Iridectomy was done the same day. The wound healed well, but the operation was not followed by any material relief to the pain, and the sight became gradually worse. Six weeks afterwards the T. was + 2 and the cornea steamy; there was still perception of shadows. At this date (April 16) the eye was excised.

It was kept in Müller's fluid five months, and the coats were then moderately hard. The *vitreous* was in an early stage of inflammation, semi-opaque, softened and less tough than normal, and the hyaloid separated very readily from the retina. There was a good sprinkling of inflammatory cells on the hyaloid, round, oval, or with incipient processes, and with large nuclei; some were dividing into two or three. There was a thin string of unusually tough vitreous adhering to the disc. The *disc* was carefully examined, and found not to be cupped. The *retina* appeared to be *in situ*, but proved on careful examination to be separated from the choroid over many large patches, both at the fundus and in front of the equator, by a very thin layer of soft, white, opaque, pultaceous substance. This was composed of structureless coagulated effusion, together with many of the rods and cones which had remained behind when the retina was removed. The rods and cones appeared for the most part quite normal, but among them were numerous round corpuscles of waxy or oily refraction and various sizes, perhaps derived from some of them which had undergone change. There were no other obvious changes of the retina in sections examined at and near the optic disc. The *chorio-capillaris* of the corresponding part was much thickened but did not contain any appreciable number of inflammatory cells. The *choroidal epithelium* sometimes adhered to the retina in preference to the *lamina elastica*. In various parts of the *retina* there were small extravasations of blood scattered at long intervals, and not numerous. They were composed of round granules of irregular size and of diffused colouring matter, and their borders were ill-defined. Several were situated close to capillaries; others were almost in contact with large vessels, from which however it is not probable that any of them were derived; probably they were all of capillary origin, in support whereof was the existence on one capillary of a minute globular

aneurismal dilatation. The *lens* was displaced towards the iridectomy scar; its equatorial diameter was diminished and its antero-posterior dimension increased, so that it was much more convex than normal. On its anterior surface, near the iridectomy scar, was a small nipple-shaped prominence, but I could not ascertain whether the capsule at this spot was entire or not. There was some proliferation of the intra-capsular epithelium in the neighbourhood of the before-mentioned prominence, where its cells were polygonal or sub-columnar not flattened. Over the prominence itself the cells were not identified and the lens-fibres of this part were pressed into a homogeneous hyaline mass. In some sections this epithelium was traced for a considerable distance behind the equator and the cells of its terminal parts instead of being multiplied were often much enlarged and hyaline. The formation of new lens-fibres from the epithelium appeared still to be going on at the equator. There was also proliferation of some of the fibre-nuclei in the superficial equatorial layers. The morbid prominence on the front of the lens was due to the distortion and separation of the lens-fibres by large spherical myeline-like globules which pushed them forwards. Probably the globules were derived from swollen fibres. There was no naked-eye appearance of disease in the iris beyond the result of iridectomy.

132. *Iridectomy for Glaucoma—Lens pricked—Excision one month later—Hæmorrhage between Choroid and Sclerotic.*

This specimen was interesting as showing a good example of the intraocular hæmorrhage which sometimes occurs after iridectomy for glaucoma, and after operations for the extraction of cataract. The eye had failed gradually with occasional "rain-bows" and attacks of pain for $4\frac{1}{2}$ years when the patient, Anne M., æt. 55, applied in December 1871 only able to count fingers with the bad (right) eye, and T. + 3. During iridectomy the lens was accidentally pricked; inflammation followed; the cornea ulcerated and the wound did not thoroughly heal, while the pain continued and became worse requiring excision just a month after admission. The cornea burst and some lens matter escaped during excision, the sclerotic collapsing somewhat. After being hardened in alcohol a transverse section was made. A

thick but unequal layer of blood was found *between sclerotic and choroid*, the latter coat being detached in such a way that its cross section enclosed a four-sided space, the sides of which corresponded to the four recti and the angles to the intermuscular spaces. In front the clot was bounded by the attachment of the ciliary muscle and behind it extended up to $\frac{1}{8}$ inch from the disc where it abruptly diminished and almost ceased, being however continued as a very thin layer all over the fundus. The *retina* near the disc was thickened, and I could not be certain whether there had been cupping of the latter part or not. There was a little red blood in the vitreous, but no considerable amount.

143. *Eye lost by simple chronic Glaucoma—No pain for several years, but beginning two years before excision, and relieved for several weeks by iridectomy, but returning with great severity, and requiring excision—History of severe Dental Neuralgia just before failure of Eye—Gout in the family.*

Eliza H., æt. 33, single, Mr. Wells's patient, stated that a "spot" came before her left eye five years before admission; this gradually increased in size and ended in complete extinction of sight eighteen months before excision. For the first three years she had no pain; at that time pain began, being at first slight and occasional, but for a year before excision very severe. The pain was relieved and the tension reduced to normal for a few weeks by iridectomy about six months before excision. She soon again began to suffer very severely, and this time the pain was somewhat regularly intermittent, lasting about 24 hours and then ceasing for the same time. The eye was excised February 9, 1872. She said that just before the left eye began to fail she had an attack of "fearful neuralgia" of the left upper jaw and that she had several decayed back teeth in the same jaw drawn without benefit. She stated also that during the more recent severe pain in the left eye the corresponding side of the nose was red and tender. Chronic glaucoma began in the other eye about four years later than in the left, and was stopped by iridectomy after she had allowed it to progress for six months. The patient was a nervous woman with dark hair and blue irides. Her father, who was an abstemious man was she believed not sub-

ject to either gout or rheumatism, but his brother, a publican, had suffered severely from gout. The father of these two men was said not to have been arthritic.

In the excised eyeball the ordinary *cupped disc* of glaucoma was found, and sections were made of the ciliary region and cornea to show the condition of those parts after iridectomy. The iris had separated at a short distance from its ciliary border, leaving a small projecting stump. The scar was just in front of the sclero-corneal junction.

MALIGNANT TUMOURS.

236. *Glioma filling the Eye and protruding at the Ciliary Region—Symptoms known for eighteen months.*

Thomas Jeffery, æt. 4 years, living at the "Rose and Crown" public-house, Hemel Hempstead, was brought to Mr. Critchett on August 27, 1872, on account of his right eye, which was quite blind. It presented a complete ciliary staphyloma, the bulging being slight at the upper and outer quadrant, but very large at the remaining three-quarters. The most prominent part was soft, of dull brownish-grey colour, not black or bluish, and large vessels ramified over it. The larger (*i.e.*, inner) part of the ciliary bulging was continuous with a very vascular granulation-like substance growing from the nasal half of the iris and apparently quite filling that part of the chamber. The pupil, a narrow slit, was displaced upwards and outwards. The eye was kept for three months in Müller's fluid, and then divided nearly vertically from behind forwards.

The whole eye was filled by a soft greyish growth interspersed with streaks and patches of white softer material. No *retina* could be found and the *choroidal line* (traceable by its pigment) was much broken and in parts separated by a thick layer of growth from the sclerotic. The *growth* was firmly adherent to the sclerotic at the bulging part, where the latter was very thin and at parts probably quite absent. The *iris* was extensively infected and formed, in fact, the front boundary of the tumour. The *lens* was lying imbedded *horizontally* in the growth at the upper and outer part of the eye, the lower part of its edge having been no doubt detached and pushed upwards and backwards, while the upper

and outer part remaining for a time attached to the ciliary processes dragged the latter and with them the iris backwards, and so caused the displacement of the pupil. On the *outer* surface of the sclerotic, about $\frac{1}{8}$ inch (3.125 mm.) below the optic nerve, there was a mass of the growth as large as a split pea. From the position of the lens it seems likely that the tumour began in the lower and inner part of the eye, and that it quickly infected the uveal tract of the corresponding part and thus grew outwards towards the sclerotic as well as inwards.

Microscopically it was found to consist entirely of small cells, generally round, sometimes oval, and often with one or more angles and short processes as if produced by mutual pressure. They varied a little in size and averaged about $\frac{1}{3000}$ to $\frac{1}{4000}$ of an inch (.0033 to .0062 mm.) in diameter. In the soft white streaks the cells were shrivelled and contained many little oil-specks. In one part close to the sclerotic they were rather larger and more oval than elsewhere. In all parts except the soft degenerate streaks the cells tended to adhere in clumps formed of many cells piled on one another.

There was no naked-eye evidence of disease of the cut end of the *optic nerve* on the eyeball; it was cut close to the eye. Microscopical examination of many sections was made but no evidence of malignant disease was found; the fibrous framework of the nerve was however decidedly thickened, being doubtless hypertrophied in consequence of the increased supply of blood to the diseased retina.

I learnt on inquiry from the child's father that in December he was in good health, and that nothing appeared to be growing in the orbit.

History.—The child was very unhealthy in infancy but no details of its symptoms could be gained. At the age of about two years it had a severe illness, which the medical man called "fever," and was not expected to live. Eighteen months before excision a "small white speck on the coloured part of the eye" was noticed for the first time. During the winter of 1871—72 the boy had "scarlet fever," and a few weeks later (six months before excision) the right eye "swelled up and got much larger," and was inflamed. From the inflammation and pain he was quite ill for a fortnight. Lately he had lost flesh and was somewhat thin when operated on but looked in other respects healthy.

The only family history of tumours to be obtained was to the effect that his mother had something in her nose which interfered with her breathing and occasionally bled. My informant told me that it was said not to be a polypus, but that it did not increase and that the woman had it for several years. She died at the age of 24, after some acute illness of only two days' duration.

134. *Melanotic Sarcoma, beginning in Lamina Fusca at region of Yellow Spot, passing outwards along the Course of the Scleral Blood-vessels, and producing a large Tumour outside the Eye, but none at all within the globe—Swelling of Disc and surrounding Retina, probably from pressure on Optic Nerve.*

Thomas Thomlinson, 10, Exthorp Villas South, Doncaster, æt. 45, was admitted under Mr. Hutchinson's care, January 12, 1872. At that time the right eye projected $\frac{1}{2}$ inch (12·5 mm.) in front of the eyebrow. There was much chemosis of the lower part of the conjunctiva. There was slight mobility of the globe in all directions. The cornea and iris looked normal, but the pupil, of medium size, only acted very slightly. There was no perception of light. The skin of the outer part of the lower lid was somewhat raised by a soft tumour which could be felt in the corresponding part of the orbit. A brief ophthalmoscopic examination of the disc showed great swelling of it and the surrounding retina; the veins were dilated and tortuous, and in a few places were slightly obscured. Three days later the chemosis had increased. Exploratory incisions were made into the tumour, with negative result. The globe was then excised and the tumour turned out with the finger; it was more or less broken up in the process, being very soft. It was quite black and probably when entire was equal in size to a large walnut. There was no difficulty in removing the tumour as it was enclosed in a thin capsule and was readily separable from surrounding parts. Portions of soft orbital tissue, some with melanotic nodules attached to them, were afterwards removed, and two-thirds of an inch (16·66 mm.) of the optic nerve was cut off; there was no evidence that any tissues at the back of the orbit were implicated. Chloride of zinc paste was then applied, and caused sloughing of the greater part of the soft orbital tissues with exfoliation of some fragments of bone.

History.—He first noticed the protrusion of his right eye about twelve months before excision and it had steadily increased up to the time of admission. The eye had, he said, been quite blind for about six weeks, and for a month or so before excision it had given him pain. A brother of the patient's father died of "cancer of the nose" at the age of 79, and a sister in the same family had a "tumour in the breast" which the patient believed "threw her into a consumption" of which she died at the age of 34.

The *black tumour* removed from the orbit was composed of round, oval and spindle-shaped cells, some pigmented, but a still larger number uncoloured. The round and oval ones were most numerous. Each cell contained a round or oval nucleus rather larger than a red blood-corpuscle.

On the outer surface of the sclerotic, at the region of the yellow spot, was a round patch of partly melanotic tissue from which the orbital tumour had grown. The eye was divided from behind forwards vertically and thin sections made through the choroid and sclerotic at the seat of origin of the tumour above-mentioned. The principal changes were:—1st, *great thickening of the outermost part of the choroid* (lamina fusca) by cells exactly resembling the normal elements of the part; 2nd, some of these pigmented spindle cells passed in branching groups almost to the inner surface of the chorio-capillaris; 3rd, the last-named layer of the choroid was much thickened, and contained scattered round, colourless cells, equal in diameter to one and a-half or two red blood-corpuscles; 4th, the capillaries and larger blood-vessels in all parts of the choroid were much dilated, the coats of the larger ones being a good deal thickened and showing here and there round, colourless corpuscles like those in the chorio-capillaris; 5th, from the thickened lamina fusca columns of large and small darkly pigmented cells could be seen lying in or close around the walls of the blood-vessels which pierced the sclerotic in that situation; one of these vessels, a large one, passed quite through to the outside of the sclerotic, being accompanied all the way by melanotic tissue which became continuous with the patch already described as forming the base of the orbital tumour; a direct continuity of structure was thus proved to exist between the starting point of development and the main seat of growth of the tumour. There was some thickening of the elastic lamina

over the region above described and it was covered with minute vitreous or "colloid" elevations not much larger than red blood-corpuscles.

It is to be noted that the greater part of the sclerotic itself at the yellow spot region was unaffected, only its outermost and loosest layers being infiltrated with patches of the sarcoma tissue; the proper tissue of the sclerotic is too dense to be opened up by such a growth unless the globe itself be first quite filled with it, and thus a distending force be added from within.

124. *Melanotic Sarcoma affecting a very large area of the Choroid—Ophthalmoscopic Examination four years before excision, sight having then been failing about one year—Total blindness for six months, and Glaucomatous Attack three weeks before excision.*

J. Abel, æt. about 45, under the care of Mr. Lawson. He lives at 10, Wellington Road, Stoke Newington, London. His left eye first began to fail in 1866, the symptom then present being a central scotoma. He was under Mr. Hulke's care for about three months in 1867 and the sight improved but was never restored. Later in the same year he became Mr. Lawson's patient and remained under care for nine months, taking bichloride of mercury. Mr. Lawson made the following note on the man's letter, in 1867:—"Choroiditis with exudation and incipient retinal detachment, V. 14 J." He ceased attendance for between three and four years, during which time the sight gradually failed; it was lost about six months before he again came under notice, on December 15, 1871. The following note was then made:—"Until the last three weeks has never had any pain, but then pain began at the root of the nose and afterwards spread to the circumorbital parts and the eye; it has been very severe. At present he has no perception of light with the eye. Cornea clear, not steamy, a.c. of good depth, iris blue-grey and looks healthy, pupil of ordinary size, lens transparent, T. + 3; a dull, greyish-pink reflex from fundus without ophthalmoscope." It was excised the same day.

The patient was seen 13 months afterwards and was then in good health, with no sign of a return in the orbit, and no enlarged glands in the neck.

The left eye was placed for about four hours in a 2 per cent.

solution of chromic acid to harden the sclerotic, and then divided vertically in the antero-posterior direction to the outer side of the optic nerve. At the inner and lower part of the eye a tumour was found springing from the choroid, and in contact by its most prominent part with the retina, which was detached in the usual umbrella form. On the retina itself were some patches of loose, white, granular matter, probably calcareous or fatty, and at the upper part just behind the lens it was of a deep, brownish-red colour, as if stained by the bloody fluid which filled the subretinal space and which contained well-formed blood corpuscles. The tumour grew from a nearly circular base, about an inch wide; the greatest thickness of the growth was about $\frac{1}{2}$ inch (8.3 mm.) thick. The growth being wide sloped off into the normal choroid around very gradually; indeed over a large part of the affected area an excessive pigmentation furnished the only means of distinguishing healthy from diseased choroid until a section was made. This diffused base of the tumour reached quite up to the edge of the optic disc on one side, but subsequent microscopical examination showed that it did not invade the nerve. In most parts the tumour was black but some whitish patches were noticed at various parts of its large area, and sections showed patches devoid of pigment near to and amongst the tissue of the sclerotic (its most intra-ocular layers only). A minute whitish spot, slightly elevated and like a small miliary tubercle, was noticed at a little distance from the highly pigmented area and surrounded by healthy choroid; when more hardened in alcohol sections were made of this; it appeared due to a considerable thickening of the chorio-capillaris by colourless tissue, apparently composed of narrow spindle-cells but not successfully isolated and proved to be such; it was certainly not composed of round cells; its surface was covered by normal epithelium. The large tumour itself was composed at its centre of beautifully formed spindle-cells; these were for the most part unpigmented, but were mixed with many small, coloured granules and large brown masses of oval, round and spindle-shaped cells; the spindle cells however formed by far the largest part of the tissue; they were rather small, and had long processes. A good many of the cells were pigmented, and there were also many masses of pigment of more or less spherical shape and varying much in size, scattered throughout the growth. The elastic lamina was considerably thickened

at the periphery of the base of the tumour. In a section taken at the confines of the growth, and including healthy choroid as well, the first change observed was thickening of the *deep* layer of the choroid by *highly pigmented* cells resembling those of the normal tissue, not by round, colourless cells; the chorio-capillaris in the same part was not altered. A little further on the pigmented cells became mingled with spindle-cells devoid of pigment; there was nothing requiring special mention in the vitreous, lens, or iris.

169. *Sarcoma of Choroid nearly filling Eye and causing pressure-ulceration of Cornea—History of five years' failure of Sight—No family history of Cancer.*

George Aggus, 50, a stout, florid gamekeeper, with nearly black hair, living at Barton Mills, Mildenhall, Suffolk, was admitted under Mr. Lawson's care, April 2, 1872. At that time there was a large, perforated ulcer of the left cornea, from whose base a granulation-like mass of considerable size projected. The history was that the sight began to fail five years before, from the temporal side, and became quite blind in twelve months. During that year he had no pain in it, only "a creeping sensation, as if something was alive between the skin and the flesh behind the ear." Soon after the sight was quite lost however he had a great deal of pain and inflammation in the eye, lasting six months. After that it remained nearly quiet, except now and then "when he caught a cold in it." The cornea appears to have been intact till about two months before excision, when after a drive on a cold day it inflamed and soon passed into the condition above described. The patient did not know of any family history of tumours or cancer; he had known all his four grandparents, and all his other relatives. There were no enlarged glands. The eye was excised at once and chloride of zinc paste applied to the orbit. In a fortnight a large slough came away, but there was some soft tissue still left in the orbit.

The eye, examined without hardening, was found to be nearly filled with a sooty, or rather slaty coloured *soft tumour springing from the choroid* by a circular base about $\frac{1}{2}$ inch (8·33 mm.) wide, at the lower and outer part, nearly corresponding to the insertion of the inferior oblique muscle. The edge of this base of

attachment was nowhere nearer than $\frac{1}{8}$ inch (3.12 mm.) to the optic disc, but *the surrounding choroid* as far as the disc, was uniformly and slightly thickened, and in sections exhibited abundant infiltration with round cells the size of white blood corpuscles, and with round or oval pigmented cells, some identical in size with the colourless ones, others a good deal larger. Precisely *similar cells* were found in great abundance between the bundles of fibres of the *optic nerve*, close to the eye; they were present *at the cut end* of the nerve attached to the eye. There were also small collections of them in the sclerotic, beneath the base of the tumour, but not bearing any apparent relation to the scleral blood-vessels. The vessels of the choroid were much dilated. The cell infiltration of the choroid was chiefly in the chorio-capillaris. In front the tumour was continuous with the mass which filled the corneal ulcer. There was a large clot of blood between the growth and the choroid at one part. In front of the equator both choroid and sclerotic were a good deal thinned, and uniformly bulging. There was no lens or retina.

The tumour consisted of cells having various elongated shapes, mingled with masses of pigment; the cells themselves were not seen to contain any pigment, but no prolonged search was made.

When discharged, about a month after the operation, there were no enlarged glands and no local return. Six months and a half after the operation, in answer to an enquiry as to return of the growth, &c., he wrote that he was "perfectly well, and had been so ever since the operation, not having had the least pain."

*135. *Unpigmented Sarcoma (probably of Choroid) originating in an Eye which had been Blind and shrunken for many years—The tumour passing through the Sclerotic, producing a large extra-ocular growth and infiltration of the Optic Nerve near the Eye—No return after ten months; patient an old man.*

This patient was an old gentleman aged 78, and I am indebted to Mr. Streatfeild, under whose care he was in private,

* To prevent this case being multiplied into two it should be stated that it was alluded to by Mr. Lawson in a paper on "A Cancerous Tumour originating in an Eye which had been long lost from some Inflammatory Affection," in Vol. vii, Part 3 of the "Ophth. Hosp. Reports," p. 285. It is there stated by a mistake for which I am answerable, that the patient had been in the Moorfields Hospital.

for the opportunity of examining the specimen. His history extended back to 13 years before excision, when his right eye became blind after some apparently spontaneous inflammatory attack, and soon became shrunken and quiet. About this time he consulted Mr. Bowman who did not think it advisable to remove the eye at that time. About two years and a half before excision he saw Mr. Hutchinson who thought excision unnecessary as the eye still remained quiet and shrunken. When he came to Mr. Streatfeild on January 13, 1872, he said that he had noticed the growth for only three weeks, but this probably only marked the date of its protrusion from between the lids. The right eye was at the above date pushed downwards and outwards beneath the lower lid; it was much shrunken. From between the lids a tumour protruded, which however seemed chiefly to occupy the upper and inner part of the orbit. An old lady, cousin of this patient, was suffering at the same time from a tumour behind her lower jaw, which was thought by her surgeon to be cancerous.

The eye was excised January 13th, the optic nerve being divided more than an inch from the eye. The whole mass removed was as large as a small hen's egg, and consisted of a tolerably firm, somewhat lobulated tumour, covered on its anterior part by the puckered remains of the cornea and part of the sclerotic, the latter tunic not being traceable for more than a short distance over the surface of the tumour. From the hinder end of the mass the *optic nerve* emerged; its proximal end looked healthy to the naked eye, its sheath at that part being quite loose and not at all thickened, but a considerable length of the anterior part of the nerve was much thickened and glued to its sheath, the whole structure at this part being almost indistinguishable, except in size, from the mass of the tumour. The cut surface of the growth was of a whitish pink colour, with occasional patches and streaks of rusty colour and a single island of darkly pigmented tissue near the front; at its most prominent part behind was a cyst about as large as a pea. The morbid growth consisted almost entirely of spindle-shaped cells of large size and quite devoid of pigment, the most highly coloured patches being due to irregular granules derived from blood extravasations.

The seat of origin of the tumour could not be made out with

any certainty, but the probability is that it sprung from the choroid. The choroid itself was but very imperfectly represented by a pigmented line within the sclerotic; at one part it, or the ciliary body, formed an irregular pigmented mass continuous with the growth which filled the eye and possibly marking its origin, or perhaps formed by the shrinking together of the choroid when the lens, &c., escaped.

I learn from Mr. Streatfeild that ten months after the operation this patient was in good health and showed no signs of local return of the disease.

88. *Sarcoma of Choroid filling about half the Globe, but not extending outside it—Glaucomatous symptoms at time of Excision—History of previous Glaucomatous symptoms for which first Iridectomy and then Paracentesis had been done.*

William Allen, æt. 54, a sailor living at 6, Jackson's Buildings, Hull, applied to Mr. Lawson, on September 9, 1871, on account of his left eye. The ordinary symptoms of glaucoma were present, with pain and congestion; there was no perception of light. Two operations had been done elsewhere, one an iridectomy and the other from his account probably paracentesis. The fundus could not be illuminated and the conjecture that there was a tumour in the eye could not therefore be proved. The eye was removed the same day and was examined eleven days later, after being hardened. A soft tumour as large as a cherry was found attached by a base about $\frac{1}{3}$ inch (8·33 mm.) wide to the choroid, occupying the posterior part of the eye and coming to within $\frac{1}{8}$ inch (3·12 mm.) of the optic disc. There was a constriction a little above the base of the tumour, beyond which it again expanded into a rounded head.

The *retina* was detached except at the optic disc and ora serrata, and its opposite inner surfaces closely applied to each other in most parts, so that there was scarcely any vitreous remaining, except a little at the front. The sub-retinal space was full of fluid blood where not occupied by the tumour. There was no trace of *lens* (had it been extracted at the former operation, when iridectomy was done?). The *tumour* was very soft at its rounded apex, and on section this part was reddish-brown and

contained much blood in several cyst-like cavities. Its base was firmer and nearly white. It was composed entirely of cells; some were spindle-shaped, others had three or more processes like the stroma-cells of the choroid, others were oat-shaped and oval. None of them contained pigment, the brownish-red colour of the softer parts being due entirely to free irregular pigment granules of rusty colour derived from blood. There were many free, round, and oval nuclei which had doubtless escaped from the cells among which they lay.

I have not succeeded in ascertaining the state of this man's health since he left the Hospital.

85. *Malignant Tumour growing from frontal bone into orbit—Very long period of quiescence followed finally by rapid growth of the tumour and death—Exploratory Puncture for confirmation of Diagnosis—Eye pushed out by Tumour, and excised on account of acute Inflammation.*

Peter F., æt. 45, came under Mr. Bowman's care on Sept. 5, 1871, with proptosis of his left eye caused by a hard, apparently bony, growth with broad diffused base, attached to the outer and upper part of the roof of the left orbit, and passing back into the cavity and upwards above the brow for about $\frac{1}{2}$ inch. In front it reached to the margin of the orbit, but its hinder limits could not be defined. He stated that the eye had begun to project seven years before and that the prominence had gradually increased. There had never been any pain till two months before admission, and it was only since that time that the sight of the left eye had been failing; at the time of admission its vision was reduced to perception of fingers. The pain had latterly been very severe. Four days later there was hypopyon, tenderness on pressure, great chemosis, + tension, and only bare perception of light. The eye was accordingly excised by Mr. Wells, and the man was discharged a few days later, it not being thought practicable to attempt the removal of the tumour. Nothing was found in the eye which threw any light on the orbital tumour; acute iritis and commencing inflammation of vitreous being the principal changes.

Nothing more was heard of the patient till February 9, 1872,

when he came again because the tumour had grown. It had increased greatly in size since his first visit, five months before. It was now firm, but less hard than it had been when smaller. On questioning the patient—a very intelligent man from Macclesfield—no history could be obtained of cancer or any tumours in any of his relatives, most of whom were known to him; he himself believed that he had never had syphilis. At this date Mr. Bowman removed a small cylindrical piece of the tumour with a trephine; it was whitish and tolerably firm, and was found to consist chiefly of large cells intersected by a few bands of normal connective tissue. The cells were for the most part round or roundly oval, but some approached to the spindle-shape. No section could be made, and so the arrangement of the elements of the tumour was not satisfactorily made out, but there were indications in some fragments of an alveolar structure, the peripheral cells of the groups being spindle-shaped or oval and the central ones round. The patient was not seen again, but his wife wrote to say that he died on July 27th with a very large tumour; “where his left eye should have been was one mass of putrifying flesh, which stood out on a level with his nose,” and “his brow on the left side was much swollen.” About a fortnight before his death an abscess formed in his left thigh, but nothing was said about secondary tumours, either on the medical certificate of death or by the wife.

MISCELLANEOUS.

147. *Chronic Irido-Cyclitis, ending in complete Blindness of one Eye—Slight Iritis of other—No cause assignable—Patient a young woman.—Anatomical Changes; Plastic Inflammation of Iris and Ciliary Body extending to Hyaloid—Retinitis with very great Elongation of Bacillary Layer and some Hypertrophy of Müller's Fibres.*

This specimen was of unusual interest, both from a pathological and clinical point of view. The peculiar changes in the bacillary layer of the retina, to be described presently, were such as I had not seen before, although Dr. Hermann Pagenstecher had shown me only a few weeks previously a drawing of a similar change. Clinically the case was a puzzle. I could not get any clue to the cause of the girl's iritis, either in her own state of health or in her family history. The most careful questioning elicited

no history of symptoms in the least suspicious of syphilis acquired from any source, and there were no signs whatever of inherited syphilitic taint. Her family was not gouty, so far as she and her mother (an intelligent Scotch woman) knew; her father, an upholsterer 50 years old, had however recently had slight rheumatism in one shoulder. She had been vaccinated a short time before the defect of sight was first discovered, and in the absence of any other ascertainable cause, it is perhaps allowable to ask whether vaccinia, even when modified by a previous attack as her's probably was, may not occasionally have iridocyclitis for one of its consequences, as is well known to be the case with variola.

Flora C. was admitted under Mr. Couper's care at the end of March, 1871, with symmetrical iritis. The right eye was the worse, vision with the left being nearly perfect and the patient herself not knowing that anything was amiss with this eye until the action of atropine showed a well-marked synechia. She attended at rather long intervals for nearly a year. In February, 1872, it was noted that with the right eye she had no perception of light; the cornea was clear; the iris yellowish-grey; the anterior chamber shallow; the pupil small, irregular and excluded, and its area white. With the left eye she could see $\frac{2}{3}$ and the iritis had not progressed. The right eye was excised Feb. 13, 1872. In December of the same year I examined the left eye again: it was just as before in all respects. The iritis had not advanced, the fundus was normal and V. good.

She is a well-grown girl with constantly very florid cheeks and red hands due to sluggish circulation; she is liable to bad chilblains. In all other respects she looks and professes herself to be in excellent health and says that she always has been so. In the early part of 1871 (late in February or early in March) she found quite accidentally that she could not see well with her right eye. A short time (a week or two) before this she had had several "styes" on the eyelids of the same eye, but with this exception she was not aware of having had any inflammation about the eye and had not at any time had the slightest pain in it until a few days before excision. As previously stated she did not know that there was anything the matter with the left eye, but atropine revealed the presence of a single well-marked adhesion. None of her friends had noticed any redness or unusual appear-

ance about her eyes at any time. She had never had any symptoms of gout or rheumatism. About two years before she discovered the defect of sight she had an eruption of "boils" on her arms; from her account it did not sound like a secondary syphilide, and this suspicion was further negatived by her assertion (afterwards confirmed by her mother) that many persons in the village (she lives in the country) had a similar eruption about the same time. She was vaccinated in January or February, 1871 (*i.e.*, probably a few weeks before discovering the defect of sight), but she could not remember the exact date. She believes the vaccination "took well" but was unable to identify the scars, or to tell me which were recent and which the results of vaccination in infancy. No unusual symptoms, either syphilitic or otherwise, followed the vaccination. It should be stated that while under Mr. Couper's care she took iodide of potassium and used atropine and blisters.

The right eye was hardened for eleven days in chromic acid and then divided vertically in the antero-posterior direction. It appeared rather small, but this may have been due to hypermetropia, not to shrinking. The *anterior chamber* contained firmly coagulated matter consisting of rather highly refracting bodies of about the size of pus-corpuscles, but more or less angular and some with short processes; these were probably altered albuminous matter; there were also a few red blood-corpuscles. The *vitreous* was highly inflamed in front, where it showed many opaque threads consisting of large multipolar cells with long branching processes, and of fine, sharply defined, anastomosing fibres (probably chromatised fibrin). The posterior part of the vitreous was normal as far as naked-eye appearances were concerned. The *retina* looked too thick near the disc, but there were no signs of other changes in it, or in any of the remaining parts of the eye, until microscopically examined. It then showed a very remarkable change in the layer of *rods and cones*. This stratum was much increased in thickness by elongation of its constituents, so that it equalled in the most marked specimens, which were near the disc, three times its normal thickness. The bulbous portion of the cones was also considerably swollen, except just at their point of junction with their cone-granules; in this situation there was often a constriction, as if the cone had been slightly drawn away from the granule and a narrow neck had been thus pro-

duced. The "cone" was thus often more or less spindle-shaped. The chief change however appeared to consist in an elongation of the outer end of each rod or cone into a fine fibre, with a slightly bulbous extremity and often one or more fusiform swellings in its course, and resembling the normal structure in refraction and other microscopical characters. When the change was further advanced the terminal swelling became a round vesicular nob, with highly refracting myeline-like outline, which frequently became detached and lay loose among the surrounding filaments. The outer ends of the very elongated rods and cones also split into several short branches, each of which was often more or less nodulated, and between which the above-mentioned nobs or globules lay, or from the swelling of which they were very likely formed. The whole bacillar layer when in this state bore some resemblance to a number of thin-stemmed plants crowded with small terminal branches and buds. These changes were present in nearly all parts of the retina, but not everywhere in an equal degree; they were most advanced near the disc, about the equator and in the neighbourhood of the ora serrata; while at and to the temporal side of the yellow spot they were only just beginning. Close to the optic disc an atrophic change seemed to have begun in the overgrown bacillary layer; its elements had become adherent to each other, and formed irregular, highly refracting, fibrous columns with large oval and circular spaces between them. Close to the disc there were also deposits of large, round, faintly granular corpuscles in the outer granule layer of the retina, and in the same situation there was a moderate œdema of the intergranule layer giving rise to oval and fusiform spaces between the bundles of Müller's fibres. There were also changes in the choroidal epithelium close to the edge of the disc, where it was somewhat heaped up, probably from proliferation; but there were no visible alterations in the other choroidal structures there or further from the disc (no sections were examined, however, further than $\frac{1}{8}$ inch (3.12 mm.) from the disc). There was diffuse infiltration of inflammatory cells into the hyaloid covering the optic disc. In all parts of the retina the connecting fibres (Müller's fibres) were more or less lengthened, as well as the bacillary layer, so that everywhere the retina was too thick; the columnar cells forming the *pars ciliaris retinæ* were also much increased in length and set more nearly perpendicular than is usual. The *iris and*

ciliary processes were highly inflamed, being swollen by infiltration with crowds of lymphoid cells; in the iris these formed prominent nodules of vascular embryonic tissue, situated sometimes near its pupillary border and sometimes near the ciliary attachment, but not in the intervening parts. The pigmented epithelial layer of the ciliary processes and its overlying cells derived from the ciliary retina was generally intact, but in a few places the cell-growth beneath had burst through into the tissue of the suspensory ligament and formed minute circumscribed collections (true microscopic abscesses) in that tissue. There was also diffuse cell-infiltration of the *hyaloid and suspensory ligament* covering the whole of the ciliary body, and a few round cells were seen in the ciliary part of the retina near the ora serrata. In the *sclerotic*, over the ciliary muscle, were a few rather large circumscribed cell-deposits between its bundles of fibres. The cell-infiltration of the uveal tract had not invaded the *ciliary muscle*, except quite in front where it became continuous with the inflamed iris; the morbid change, so far as deposit of new cells was concerned, was limited to the iris and the ciliary processes, and stopped almost abruptly at the position of Schlemm's canal. There was, however, *œdema of the ciliary muscle*, its bundles being here and there separated by highly refracting substance, probably coagulated albumen, with an occasional corpuscle. The *cornea* was healthy in minute structure. The *lens* showed signs of œdema and probably of cell proliferation; there was a homogeneous structureless layer (coagulated effusion) beneath both anterior and posterior capsules, but disappearing at the equator; the lenticular epithelium was represented by a number of beautifully egg-shaped, large, highly refracting, cell-like bodies, some nucleated others quite homogeneous; they were probably swollen epithelial cells. In the superficial layers of the lens there were many oval nuclei, some large but most of small size and granular. They appeared to be much more numerous than the normal nuclei of the lens-fibres from which they were probably derived; they were most numerous (as are the normal nuclei) at the equator. In various parts there were large globular masses like myeline derived from swollen and ruptured lens-fibres.

108. *Irido-choroiditis beginning at almost same time in both eyes and steadily getting worse—In one eye the attack followed by Secondary Cataract, which was extracted—Subsequent shrinking of the Globe, with great thickening, in patches, of the outer layers of Retina, and epithelial disturbances of Choroid—Iridectomy in other for Artificial Pupil—Preservation of some Sight—Rheumatic nature of the Disease—Mother of Patient Rheumatic.*

The left eye of Kate H., æt. 25, excised by Mr. Couper, Nov. 3, 1871. The history of the patient from whom this eye was removed is very curious, from the difficulty of assigning any cause for the destructive changes which occurred in her eyes. The specimen itself shows an unusual change in the retina, but in other respects it does not throw much light on the nature of the malady.

The patient was a robust country girl with dark hair and blue irides, living in Hampshire. She was, when seen, and had always been, in good health. There appeared no reason to suspect syphilis, either acquired or inherited, but direct questions as to the acquired disease were not asked. Catamenia had always been regular. About five years before she came to the Hospital her left eye inflamed, with some pain, and about a fortnight later the right was similarly affected. From that time they steadily got worse, never improving in the least. Excepting at the beginning of the attack she suffered very little pain.

She herself had never had any arthritic symptoms whatever, either in joints, fascia, or in connection with nerve-branches. Her mother was stated to suffer much from chronic rheumatism in the hips and in other joints; "her hips often give out with pain;" she "often has rheumatics badly all over her head." Many of her joints were stated to become swelled and painful at times; she had been for many years very deaf. There was no other arthritic history known in any of the patient's brothers, sisters, uncles, or aunts.

The patient came up to the Hospital three months before the left eye was excised. Soon after admission the opaque lens was extracted from the left, and iridectomy upwards was done in the right, the pupil being quite occluded by a thin membrane. At the time of excision (three months after the above operations)

the left eye was soft and much shrunken, the cornea being still clear. The right was also soft but not obviously shrunken; cornea clear; a good upward artificial pupil. With it she could see large objects. There was no congestion or tenderness.

The principal changes found on dissection of the much shrunken left eye were a thickened and contracted state of the part of *iris* which remained; abundance of opaque white inflammatory tissue lining the inner surface of the *ciliary body*; a stringy, tough, but clear *vitreous*; the *retina* probably nowhere in accurate contact with the choroid, was slightly lifted from it by numerous large elevations on its own outer surface, and there were *old choroidal changes*. By *microscopical examination* of the *vitreous* I failed to detect in it any blood-vessels. The *retina*, examined fresh without hardening the eye, was semi-transparent and not much if at all stiffened; from its outer surface projected several opaque white prominences, tolerably well circumscribed and of considerable size, the largest being about the size of a hemp-seed. When hardened and examined in section, these lumps proved to consist simply of the much thickened connective tissue of the retina, especially the vertical portion of it; there was not, however, any separation of the overgrown tissue into bundles or pillars with clear interspaces. Sections of the retina in parts not apparently diseased showed considerable thickening of its whole structure by the same change; the rods and cones were absent altogether. There were many small spots of adhesion between retina and choroid. The *epithelium of the choroid* showed many minute fissures and spots of deficiency invisible to the unaided eye, and also a few round spots of deficiency just visible without magnifying through which the thin stroma and the sclerotic could be seen. The epithelial cells themselves were often enlarged and round; sometimes the nucleus was enlarged. There was no colloid degeneration of the choroid. No trace of lens.

61. *Chronic Irido-Choroiditis in one Eye, leading to Blindness—*
Iritis in other Eye—History imperfect, and cause of Eye
Disease not ascertained—Lost Eye excised after being blind
several years—Thick layer of Fibrous Tissue (containing Choles-
tearine) within Choroid, and Diaphragm of same across Hyaloid
Fossa—Detachment of Retina—Atrophy of Choroid, with Cell-
Infiltration of Chorio-Capillaris—Fluid Chalky Cataract.

Maria N., æt. 60, left eye excised by Mr. Lawson, July 18, 1871. The history is unfortunately very defective, the only facts being that she had attended the hospital at intervals, since 1866, the diagnosis originally made in 1866 being blindness from irido-choroiditis in the left eye, and chronic iritis in the right. At date of excision the left eye was somewhat shrunken, cornea clear, pupil white as if occupied by chalky lens. Examined directly after excision it was found that the *lens* was converted into a milky fluid, the opacity of which was due to spherical, calcareous globules, dissolving with effervescence in nitric acid, and leaving a granular, cloudy matter behind. The iris was in contact with the cornea. There was detachment and thickening of the *retina*, and only a drop or two of clear, viscid vitreous remained. On the inner surface of the *choroid*, and perforated by the optic nerve, was a thick, cup-shaped *layer of firm white tissue*, feeling like cartilage. It extended forwards to the ora serrata, where it joined a diaphragm of similar tissue which stretched across the eye just behind the posterior lens-capsule. This tissue contained no bone nor cartilage; it consisted entirely of fibrous tissue, not unlike that of tendon but less wavy. There were many little collections of cholestearine in its substance, recognisable by the microscope and also as minute yellowish dots by the naked eye. The outer surface of this new tissue was somewhat tuberculated in correspondence with depressions in the choroid and sclerotic. The *choroid* itself showed signs of atrophy in the complete absence of its epithelium, thickening (without colloid disease) of the elastic lamina and partial atrophy of its stroma; while the existence of chronic inflammation was shown by the infiltration of small round cells into the chorio-capillaris, and the occurrence of globules and hour-glass masses of deposit, like those found in the pineal gland and choroid plexuses of the brain (probably calcareous).

227. *Small Abscess without known cause between Sclerotic and Choroid, causing three months' attack of Inflammation—Eye then quiet for nearly eleven years; excision for relapse of pain—Circumscribed collection of Cheesy Pus between Choroid and Sclerotic, surrounded by much fibrous thickening—Retina partly detached—Eye shrunk.*

John D., æt. 44, was admitted August 6, 1872. His right eye was quite blind, considerably shrunken, and very soft. The cornea looked healthy, the iris was greenish-blue, the pupil small, probably excluded, and its area white. The eye had been painful for about a week and that was his reason for coming. The left eye was perfect and had never ailed anything. He said that the right eye had inflamed 11 years before, without any cause that he knew of except "a cold." The attack lasted three months and was attended by great pain and redness; "the eye was like raw beef." The attack began in the month of January, and ended in permanent blindness. The eye had never troubled him since then until he came to the hospital. He gave no history of primary syphilis, or of subsequent syphilitic symptoms, nor was there any arthritic history in himself or his relatives. He was a shoemaker, and had always enjoyed good health.

The eye was excised by Mr. Critchett on August 6, 1872, and hardened in Müller's fluid for two and a half months. At the outer part of the eye, nearly corresponding to the insertion of the inferior oblique muscle, a small perfectly *circumscribed collection of cheesy matter* was found within the sclerotic; it was about as large as a hemp-seed. It was situated in the midst of a thick large patch of tough fibrous tissue, consisting of sclerotic, choroid and retina fused into one and much thickened by new tissue; the pigment line of the choroid at this patch was very irregular and often quite lost, and it was therefore impossible to be quite sure whether the abscess was external or internal to the choroid, but it seemed on the whole more likely to be external so far as could be seen. The mass of cheesy matter consisted of degenerated pus-corpuscles and oil-globules. The retina elsewhere was detached in the usual manner. The lens was calcareous and fluid. There was extensive "colloid" disease of the posterior half of the choroid, the growths being very small and not disturbing the epithelium. The sclerotic was everywhere thickened, but much more so on the side corresponding to the abscess.

146. *Cholestearine passing into Anterior Chamber by aperture in Suspensory Ligament and Retina leading from the Subretinal Space, in which much of it was present—Patient liable to Sick Headaches, &c.*

Priscilla P., 33, married, lost the sight of her left eye gradually in about two or three years, and it had been quite blind for seven years at time of excision. The chief peculiarities at the latter date were an abundant deposit of sparkling cholestearine crystals on the back of the cornea, and a shining golden lustre from the lens due to the same cause. She knew of no cause for the failure, and could only say that it had been accompanied by occasional severe pain. The eye was removed February 12, 1872, because it had begun to induce sympathetic irritability and occasional dimness of the other. Old *detachment of the retina* was found extending even to separation of the ciliary part. There was old fibrous tissue on the inner surface of the *ciliary body*, and in this layer was a circular hole as large as a large pin's head, with rounded smooth edges and evidently of old date, through which the contents of the subretinal space communicated with the anterior chamber by the side of the lens, the suspensory ligament being absent at the same part. There was a very large quantity of cholestearine in the subretinal space, and this could easily be made to pass backwards and forwards into the anterior chamber. The lens was full of cholestearine.

This patient was subject to bad sick headaches and vomiting, but she had never had jaundice; she was sallow, had black hair, and blue iris.

231. *Cataracts in Childhood associated with craggy teeth and small stature—Symmetrical Keratitis of doubtful nature—History that patient took much mercury in infancy—Query: May the mercury have influenced the development of his lenses and of his teeth?—No history or signs of Hereditary Syphilis—No family history of Infantile Cataracts, or Bad Sight—One Eye Lost after operations with Needles and Syringe; good result in the other Eye after use of needles only—Changes in the Lost Eye—Iritis—Ciliary Processes dragged forwards—Retina Detached and shrunken, a diaphragm of new fibrous tissue stretching across Eye behind Lens-capsule—Altered Blood in Subretinal Space.*

The right eye of Robert S., 22, Mr. Streatfeild's patient. It

was excised for inflammation and loss of sight, following operations for cataract (? congenital). The case is of interest, because it was his mother's impression that the craggy and dwarfed condition of his second set of teeth had been caused by his taking many "gray powders" in infancy for "fits," and the question arises whether infantile cataract, which is so commonly associated with rough craggy permanent teeth, may also sometimes be due to the long-continued exhibition of mercury in early childhood.* In the present case the patient had (according to his mother's statement) many gray powders at intervals during a considerable period of his infancy, while he was subject to convulsions, but she did not remember that the medicine appeared to injure his health in any way at the time. There is no history of symptoms of infantile syphilis. He is at present of small frame and has a pale, earthy complexion, but shows no signs of hereditary syphilis. His teeth (incisors and most of the molars and bicuspid) are short, narrow, discoloured and very craggy, but not notched. At the age of 13 he came to the hospital with double "keratitis," but there are no notes on the paper explanatory of its precise nature. At that time it was noted on his paper that he also had cataracts. He says that when quite young he could see well and believes he could read the finest print as well as other children, so that his cataracts were probably not congenital; the corneal affection got well in about a month and never relapsed. Eight years later (March, 1871) Mr. Streatfeild began to treat the cataracts. In the right eye he used, first a needle; second (a month later) the syringe; third (after another month's interval), a needle again. A few days after the third operation the eye inflamed; it got better and relapsed several times, losing more sight each time, and finally losing all perception of light about three months before excision on August 12, 1872. On the other eye four needle operations (but no suction) were done, with an excellent result. The eye was examined, after having been for two months in Müller's fluid and then divided vertically in the antero-posterior direction. There was detachment and great contraction of the *retina*, the *vitreous* chamber being represented only by a

* I believe I have heard Mr. Hutchinson suggest the possibility that the development of the lens may sometimes be influenced by mercury given in childhood, and infantile cataract be thus caused, and I may unconsciously have borrowed the idea from him.

small central tube containing gelatinised albuminous matter. The anterior part of the retina was in the form of a flat plate attached by its edge to the ora serrata; the posterior part formed a tubular pillar attached behind to the disc and in front to the centre of the aforesaid flat plate behind the lens. The *lens-capsule* was thin, nearly transparent and adherent to the pupillary edge of the iris. The *ciliary processes* were dragged inwards (towards the ocular axis) somewhat, and the lens-area* thus diminished. Attached to the hinder part of the ciliary body, just in front of the ora serrata, was a complete *diaphragm of tough, white, glistening, fibrous tissue*, thickest at its centre and everywhere closely adherent to the front (disc-shaped portion) of the retina. Some parts of it were united with the lens-capsule, but in most places there was a considerable interval between them. The part of the ciliary body to which the periphery of this diaphragm was fixed had become drawn forwards and inwards, so that in section it closely resembled a second ciliary process. The *subretinal space* was full of old blood, separated into semi-opaque gelatinized serum and pale buff coloured clot. The clot contained red blood-corpuscles in various stages of degeneration, and some still well-formed; also many corpuscles of considerable size composed of large, highly refracting granules (? calcareous or fatty), and a few single, needle-shaped crystals, perhaps hæmatoidin. The patient is one of a family of two; his sister is reported to have good sight, and there is no family history of infantile cataract.

97. *Eye lost after Extraction of Cataract—Detachment of Choroid from Sclerotic and of Retina from Choroid by Fibrinous and Albuminous Matter, probably decolorised Blood.*

The right eye of Sarah M., æt. 58, Mr. Lawson's patient. Cataract was extracted by the modified linear operation on July 21, 1871. Two or three days later it began to pain her, and continued very painful for nine weeks. It then became comparatively quiet. At the date of excision, October 7, 1871 (two months and a half after the cataract operation), the eye was shrunk and soft. There was not then any pain but it had hurt her somewhat a

* By "lens-area" I mean the area enclosed by the ciliary processes and normally occupied by the lens. It is an awkward phrase, but I know of none shorter and more expressive.

few days before. No sympathetic irritation of the other eye, which also contained a senile cataract, had occurred.

Hardened for two months in chromic acid. There was detachment and shrinking of *retina* and total absence of *vitreous*. The *choroid* and *ciliary body* also were detached from the sclerotic from a short distance behind the equator forwards as far as the attachment of the ligamentatum pectinatum iridis, except at the upper part where the operation wound had been made, and there the ciliary body still adhered to the sclerotic. In the sub-choroidal space there was a quantity of tough fibrous material composed of straight highly refracting fibres, in which no nuclei were seen, mixed with granular matter and other forms of coagulated albuminous matter from the blood. Similar matter, but without the straight fibres, occupied the subretinal space and anterior chamber. Probably all these substances were derived from blood, the straight highly refracting fibres being altered fibrin and not an inflammatory new tissue.

187. *Vascular Cord traversing Vitreous and co-existing with great Plastic Inflammation of Hyaloid and minor alterations in Retina and Choroid—Formation of Connective Tissue beneath anterior Lens-capsule—Elongation of Rods and Cones—Effusion between Choroid and Retina—These changes occurring in an ill-grown weakly child, born prematurely—The Vascular Cord in Vitreous probably a thickened persistent Hyaloid Artery—The other changes most likely secondary to it.*

Emma G., æt. 5 years at the time when her left was excised, was first brought to Mr. Hutchinson when about æt. 2 years, and the same operation was then advised, but declined; probably therefore, the changes in the eye did not advance very quickly. At the date of excision the pupil was circular and dilated, the lens probably transparent, while a yellowish patchy reflection came from the back of the eye when examined without a mirror or lens; no vessels could be seen on the opacity by concentrated light. The cornea was steamy and the globe appeared slightly enlarged though only very slightly congested. It was supposed at the first visit, three years before, that the eye probably contained a cancerous growth, and the same diagnosis appeared more likely than any other to be true at the date of excision on May 6, 1872.

History.—The patient is the fifth in a family of eight. Neither she nor any of the others appear to have had any symptoms of hereditary syphilis, and she shows no signs of it. She was born prematurely, the mother believes at eight months, and was very small and weak as a baby. At about six months she had measles and the attack left her very weak and out of health. It was at about this time that her mother first noticed “the black of the eye turn colour.” There is no history of pain in the eye, and the mother does not know when it began to enlarge. The child is still (January, 1873) very puny and ill-grown; her forehead is large and prominent, with thin skin and large veins (? slight hydrocephalus), while the face is disproportionately small. She is fairly intelligent. She presents no congenital defects or monstrosities. Two of the other children are said to have been weak and small in infancy, and the father is very “delicate.” No other clue can be obtained as to the cause of the state of the eye, and in view of the generally backward condition of the child's bodily development it seems probable that the inflammatory process which destroyed the eye was the result of persistence of the foetal hyaloid artery and the supervention of nutritive changes, primarily in the parts supplied by it and afterwards in other structures. I regret that I omitted to examine the other eye with the ophthalmoscope; she can, however, see well with it.

The eye was excised May 6, 1872: after excision it transmitted light well. The globe was elongated. The *optic nerve* outside the eye was much atrophied. It was kept in Müller's fluid five months, and was then moderately hard and was divided equatorially. The *anterior chamber* was deep and the *posterior* much enlarged, thus accounting for the elongation; both contained material like that which filled the *vitreous chamber*, a soft, brittle, gelatinous substance like bad calves'-feet jelly, and microscopically showing nothing but a finely molecular appearance; no doubt this substance was albuminous. The *iris* and *lens* looked healthy. On washing out part of the altered vitreous, the chamber was found to be crossed by two fine tough threads, which were attached behind about $\frac{1}{16}$ inch (2.5 mm.) to the inner side of the optic disc, and in front to about the middle of the back of the lens-capsule. They were stiff and quite distinct from the surrounding vitreous which had just the same microscopical characters close to them as elsewhere. One of them, the larger,

was as thick as stout sewing thread, the other very much thinner; they were close together, and spread out at each end into a sort of foot.

There were many other more or less tough strings in the foremost part of the vitreous, close to the back of the lens, and two of these stretched backwards for a short distance and were again attached at their opposite ends, thus bridging over a small arc of the ocular curve, but the rest were attached only at one end. These latter were found to consist of connective tissue elements in various stages, round cells, spindle-shaped cells, and long fine highly-refracting fibres looking like elastic tissue but not curling up when broken, and each with an oval nucleus. There was also here much rust-coloured pigment, in masses like compound granule corpuscles. The *retina* was *in situ* and everywhere much and irregularly thickened, at least it appeared to be so while the hyaloid remained in normal position, but probably much of the change was due to the latter membrane, for the optic disc could not be recognized being probably bridged over by thickened hyaloid. The *iris* appeared normal to the naked eye and was not adherent to the lens-capsule; it was, on the other hand, separated from the lens by a considerable depth of structureless coagulated translucent substance. Sections of the iris showed no appreciable thickening of its substance, but a rather doubtful increase of its nuclear or corpuscular elements.

Microscopical Examination.—The larger of the two cords crossing the vitreous contained two large blood-vessels which ran through its whole length. At the back of the lens they divided into branches which could be traced only a short distance, and whose mode of ending could not be ascertained. They took origin from one or more of the large retinal vessels near the expanded base of the cord. The smaller cord contained no visible blood-vessel. The cords were composed of a finely fibrous structure arranged in a reticular manner, each of its meshes containing a round or oval corpuscle. The peripheral parts of the cord were more fibrous and contained fewer and smaller meshes than the part surrounding the blood-vessels. In front the two cords expanded and passed into a fibrous structure at the back of the lens (thickened hyaloid), which was continuous at the circumference with the similarly altered hyaloid covering the ciliary body. The change above men-

tioned which to the naked eye appeared due to general thickening of the retina was proved microscopically to be caused by enormous thickening of the *hyaloid* and conversion of this membrane into a reticulated fibrous tissue with small meshes, each filled by a finely granular corpuscle. This new tissue varied much in thickness, being sometimes twice as thick as the retina and sometimes quite thin; it was thickest near the retinal origin of the vascular cords traversing the vitreous, with which indeed it was continuous. Its innermost (vitreous) layers were distinctly fibrous and arranged more or less parallel to the nerve-fibre layer, this part of the thickened hyaloid being continuous with the cortical part of the vascular cords. In its deeper (retinal) parts the meshes were more or less circular, and composed of substance which refracted light more strongly than the superficial layers. The thicker parts of the new tissue contained comparatively few blood-vessels (excepting just at the base of the vascular cords, where there were many large ones), but in some parts where it formed only a thin layer on the inner surface of the retina many vessels of considerable size were seen imbedded in an almost hyaline matrix containing thinly scattered oval and round nuclei. The *retina* showed great alterations of its most vascular parts, and comparatively trivial changes in its outermost layers. The *limitans interna* could be recognized in many parts but was generally indistinguishable where the new (hyaloid) tissue was thickest. No *nerve-cells* were visible; only a thin fibrous layer was present to represent the *nerve-fibres*, and even this was not always present. The whole retina had somewhat the appearance presented by the reticular hyaloid tissue above described, its interstitial fibrous framework being thickened and converted into highly refracting meshes. The stratification was fairly preserved in some parts, but quite destroyed where the change had gone further; nowhere were the vertical fibres of Müller visible. The rod and cone granules of the *outer granule layer* could not be distinguished by size or refraction from the connective tissue nuclei of the same part. There was no change of the *outer limiting membrane*. In the *bacillar layer* there were various alterations; in some parts it was normal, but in most sections one or other of the following changes were present:—lengthening of the outer halves of the rods and cones with the formation of minute terminal clubs (this

increased lengthening was nowhere excessive); swelling of the inner (bulbous) ends of the cones into wide ovals or even spheres; adhesion of pigment granules from the choroidal epithelium to the apices of the rods and cones, and its passage for a short distance inwards between them (this adhesion did not occur at any parts where the rods and cones were of normal dimensions); effusion of a layer of structureless substance between the pigment granules adherent to the rods and cones and the remaining parts of the choroidal epithelial cells (this layer was sometimes equal to or greater than the thickness of the bacillary layer); atrophy of the rods and cones more or less complete, passing through a stage in which they were represented by short irregularly bent rods with large globular interspaces (atrophied cones), to total disappearance and fusion of choroidal epithelium with *limitans externa*. The *choroid* was thickened by œdema of its deep layers but showed no cell changes, and the chorio-capillaris, except that it was a little thickened, looked normal. There was no change of the elastic lamina. The *lens* was much altered. Its capsule was normal except that it was puckered at its central part in front. Within the capsule there was everywhere (except just at the equator) a thick layer of the same homogeneous coagulated effusion as occupied the vitreous and corneal chambers. *Immediately within* the anterior capsule, and between it and the before-named homogeneous albuminous effusion, was a layer of connective tissue nearly as thick as the iris and consisting of regularly laminated fibrous substance somewhat like the cornea. It began by a thin edge a short distance in front of the anterior termination of the suspensory ligament, and rapidly attained its full thickness which remained uniform until it reached the corresponding point on the opposite side of the front of the lens, where it ceased by a similar sharp edge. Just at its origin on each side the new tissue contained many oval and almost round cells which appeared to be continuous towards the equator with the capsular epithelium, and it is probable that they were derived from these. Elsewhere its corpuscles were long ovals contained in pointed spaces running parallel to its surface. Beneath this connective-tissue layer, but separated from it as before said by a quantity of albuminous substance, was a stratum of lens substance in which the nuclei were immensely increased in numbers, so that it looked like an ill-formed dimly-

fibrous substance thickly studded with small bluntly-oval corpuscles some of which had already become granular and fatty. This stratum was continued all round the lens. The parts next beneath this showed no increase in number of their nuclei but an alteration in shape and size, the nuclei often lying in large spaces of oval or spherical shape filled by hyaline highly-refracting substance, so that the space and its contained nucleus somewhat resembled a cartilage cell. The central parts of the lens showed no obvious changes, and here as in the part last described, the lens-fibres were well preserved. At the *equator of the lens* the capsule was only slightly and irregularly separated; there were in some sections irregular collections of nucleated round cells just within the capsule at this part, probably derived from its epithelium; in other sections masses of large globules, either oil or myeline, were observed. The suspensory ligament was diffusely infiltrated with round corpuscles like pus-cells. The *cornea* was perfectly healthy, as also was the *ciliary muscle*. There were a great many rust-coloured corpuscles of various sizes, and doubtless deriving their colour from blood in the thickened hyaloid at the back of the lens.

CASE IN WHICH DESTRUCTIVE ULCERATION OF CORNEA
FOLLOWED THE REMOVAL OF A MALIGNANT WART
ON ONE EYELID.

By W. NEWMAN, M.D., Stamford.

On May 15, 1872, I applied silk ligature to a wart on left lower eyelid of a lady æt. 76, of feeble mental and bodily health. The wart had suddenly taken on rapid growth, and had all the appearances of epitheliomatous disease.

May 18. The growth dropped off, leaving small sore.

May 20. Surface nearly well; conjunctiva of left eye slightly red; cornea clear.

May 22. Cornea clear; eyelids not swollen. The maid speaks of some little discharge from between lids. It would appear to be of small amount.

May 25. Has not been so well the last two days. Of this I had heard nothing. Lower third of cornea occupied by sloughy ulcer; upper two-thirds clear. Abundant purulent discharge.

May 29. Has been much depressed; bad nights; free discharge; ulceration of cornea extending; hypopyon.

Dr. Taylor, of Nottingham, saw patient with me, and under chloroform performed upward iridectomy, incising also freely the chemosed conjunctiva.

The subsequent progress has been fairly good; the general health has improved, but the eye has shrunk, and there does not seem to be even perception of light.

I have put these brief notes on record as an illustration of the possible sequence of a very small operation on the eyelid. The ligature was selected from the difficulty of keeping the poor lady quiet.

A decided interval of apparent well-doing will be noticed between the removal of the growth and the onset of destructive mischief about the globe.

PART II.

A Periscope

OF

CONTEMPORARY OPHTHALMIC LITERATURE.

THE TREATMENT OF SQUINT AT THE DUTCH OPHTHALMIC HOSPITAL.*

Liebreich's plan of separating the conjunctiva and caruncle from the subjacent parts has been followed since 1867 in every case of considerable squint. Dr. Snellen finds that if the scissors are passed deeply under the conjunctiva, vessels of considerable size may be wounded, and if the capsule of Tenon is at the same time opened, the blood may pass into its cavity.

Jansje P., 10 years old, from Vlissingen (No. 297, 1867), had a convergent strabismus of the right eye. In the left one there was H $\frac{1}{2}$, and perfect acuteness of vision; whilst the sight of the deviated eye was so much impaired, that fingers could scarcely be counted. Besides the squint, there was a partially absorbed traumatic cataract in this eye. On the 2nd March, Dr. Snellen performed tenotomy on the right eye, without chloroform; the patient was very unsteady. The conjunctiva was freely dissected up under the caruncle: suddenly the expression of the eye changed, it projected so that the speculum became firmly fixed between the eye and the lids. Dr. Snellen passed a hook quickly under the tendon and divided its attachment. Blood was manifestly effused into the cellular tissue, yet attempts to let it out did not succeed. An accurately fitting pressure-bandage was immediately applied. The patient complained of a feeling of pressure, but had no pain then or afterwards. No symptoms of inflammation appeared: next day the protrusion was much less, the lower lid and parts around it were widely discoloured by blood which had spread along the subcutaneous cellular tissue. The further course was regular, and the position of the eye just as desired.

The same mishap occurred in another case. Geertje van H., 21 years old, from Hello (No. 490, 1867), had strabismus convergens of the left eye, nystagmus and maculæ corneæ in both

* From "De operatie van het scheelzien." Acad. proefschrift door S. J. Halbertsma, Utrecht, 1869.—TRANSLATED BY MR. T. WINDSOR.

eyes. The operation was performed on the left eye on the 27th April, without chloroform; the course was normal. Owing to the amount of the squint, the operation had to be performed on the other eye also. This was done on the 4th May without chloroform, the patient keeping perfectly steady. As the scissors were being used under the caruncle, the globe suddenly projected to a formidable degree; so far forwards indeed, that it was impossible to continue the operation. The speculum was removed with great difficulty from between the lids. A pressure-bandage was at once applied. The course afterwards was just as in the former case. Seven days later, the operation was repeated on the right eye, and the squint was perfectly cured.

Dr. Snellen remembered that he had cut, whilst pressing the scissors backwards, in both cases. Since then, he has always taken care, when dividing the cellular tissue under the caruncle, to keep the scissors forwards (away from the globe towards the inner surface of the conjunctiva), so that the caruncle and the conjunctiva are in some measure removed from the globe. With this precaution there have been no further cases of effusion of blood into the orbit.

Dr. Snellen has communicated to the author three cases in which the sclerotica has been wounded: in all of these sharp-pointed scissors had been used. The first case was that of a girl six years old. She was very unsteady when the conjunctiva was divided. On introducing the blunt hook, the operator found that it passed into the globe; the operation was not completed. The wound healed regularly. The vision remained as before. The child still squints.

The second was a case of divergent squint in a young lady of 14. The details of the operation are unknown. When she came, six months later, to Professor Donders, the vision of the wounded eye was reduced to one half, and there were slight opacities in the vitreous. Nothing else abnormal could be found. The operation was repeated on both eyes, with a satisfactory result. On the side of the injury the conjunctiva and the capsule of Tenon were closely united to the sclera.

In the third case the sclera was wounded in dividing the tendon. Violent inflammation was the consequence, and the sight of this eye was totally lost.

No such case has ever occurred at the Dutch Eye Hospital, where blunt-pointed scissors are used.

Dr. Snellen has operated latterly in the following manner:—The conjunctiva is freely divided in a direction parallel to and directly over the muscle: thus in convergent strabismus the incision would extend from the edge of the cornea towards the caruncle. Wounds in the conjunctiva parallel to the margin of the cornea are inclined to gape, especially when the eye is turned in the opposite direction; wounds vertical to the margin of the

cornea are, on the contrary, inclined to close when the eye is rotated in the opposite direction. If necessary, a suture can be applied without any fear of diminishing the effect of the operation. The operator next holds with forceps first one lip and then the other of the wound, and separates with blunt-pointed scissors the conjunctiva to an equal extent above and below. The caruncle is then held and treated in the same way. The closed forceps are placed between the edges of the wound on the middle of the muscle, opened, then gently pressed down and closed, thus inevitably seizing the muscle, into which a small aperture is now made close to the sclera. Two exactly equal incisions can now be made by inserting one blade of the scissors through the opening and the other between the muscle and the conjunctiva.

The advantages assigned are the following:—

1. The operation is easier. There is no risk of wounding the sclera (hence sharp-pointed scissors may be used so as to separate the attachment nearer to the globe). There is no danger of dividing Tenon's capsule too far in any direction.

2. The operation is less painful.

3. Extravasation of blood under the conjunctiva is prevented.

4. When desired, the capsule can be divided to a greater extent on one side so as to alter the action of the muscle.

A somewhat similar operation is proposed by Dr. Snellen for paralysis of the ocular muscles. "The conjunctival wound is in the direction of a meridian (from before backwards). The muscle is divided in the usual way, but a little further back than in tenotomy, so that a small piece of it remains attached to the sclera. Two sutures are now applied in the following way: through the upper edge of the wound in the conjunctiva, through the remnant of the tendon on the sclerótica, through the muscle drawn forwards, and again through the same edge of the wound in the conjunctiva. The second suture is inserted at the lower side exactly in the same way and parallel to the first. Both are now separately drawn tight and knotted. So made, they cannot possibly become loose too early. As the knots are on the outer side of the conjunctiva, the threads can be easily removed at any later period. The risk of inflammation may be lessened by separately uniting the conjunctival wound. It is not always necessary to divide the antagonist."

In his last chapter the author tabulates the operations which were performed at this hospital for strabismus in the years 1866—69.

VISIBLE PULSATION OF THE RETINAL VESSELS.

Otto Becker writes a long paper on the subject of visible pulsation of the retinal vessels. He examined the eyes of a series of

patients suffering from heart disease with the ophthalmoscope, and found that in cases of insufficiency of the aortic valves, spontaneous pulsation of the arteries on the disc and of the retina was almost always present. After making these observations, he had his attention called to a communication from H. Quinke on the same subject in the *Berliner Klin. Woch.* 1868, No. 34, and 1870, No. 21. These communications seem to have escaped the notice of ophthalmologists. He speaks of arterial, venous, and capillary pulsation in insufficiency of the aortic valves, the capillary pulsation being characterised by alternating pallor and redness of the disc when seen in the erect image. He only met with pulsation in marked cases of aortic disease, and did not always meet with it at each observation of the same case. Becker finds it in all cases and at all times. Sometimes, however, it is necessary to excite the circulation by letting the patient walk about or by giving a stimulant. At first he was unable to assure himself of the capillary pulsation, but latterly he had been able to do so. The filling of the trunks of the arteries and the emptying of the veins on the disc are synchronous with the cardiac systole. The arterial pulsation could also be seen in branches at a distance from the disc equal to three or four of its own diameters. He recommends that the observer's attention be directed to the light streak seen on the arteries. He will find that this increases in breadth, and, also, at the same time, the darker streaks on either side of it increase in breadth. The artery also increases in length, as may be seen by watching a curve. The pulsation can be seen best, and sometimes only, just before a large trunk gives off branches at a considerable angle. All these points are described in detail.

Notes of seventeen cases are given: the conclusion derived from them is that simple aortic insufficiency with or without hypertrophy of the left ventricle produces spontaneous pulsation of the arteries of the disc and of the retina. There was one exception. The patient was very anæmic, the radial pulse was small and soft. The anæmic condition probably accounted for the absence of retinal pulsation. In one case in which aortic insufficiency was diagnosed and no pulse was noticeable, the autopsy showed that no aortic insufficiency was present. In one case pulsation was noticed in the left eye, but was only discovered after close examination in the right. The diagnosis was of aneurism of the left carotid, chiefly, and of the innominate and arch of the aorta in a less degree. The feeble pulsation detected in the right eye was probably due to slight aortic insufficiency produced by the neighbouring aneurism.

He enters at length into the question as to what has hitherto been understood by the terms arterial and venous pulse. What has hitherto been designated as spontaneous, arterial, retinal pulsation would be better named intermittent flowing in of arterial

blood into the eye. The venous pulse may be said to be a "natural sphygmograph." It cannot be termed pulsation, in the ordinary meaning of the term venous pulse, that is, pulsation of the veins owing to insufficiency of the tricuspid valve. He has made experiments on the mesentery of frogs as to the calibre of arteries in which pulsation may be seen. In the largest of these arteries no pulsation could be detected, but there was a rythmical acceleration of the stream. The venous stream was continuous. Pulsation could easily be detected in an artery before it had left the intestinal wall, and before it split up into several branches. A drop of water applied intensified the pulsation. In cases in which he had formerly seen *arterial pulsation in the eyes of healthy individuals*, he had often explained it to himself as communicated from the veins, and therefore not synchronous with the radial pulse. He has lately, however, seen undoubted rythmical, arterial dilatation and elongation in the arteries of the disc and of the retina, in the eyes of perfectly healthy individuals. He gives cases. In one he could assign no cause; but in another case, recollecting his observations on the mesentery of frogs, he was led to surmise that the arrangement of the vessels was the cause. He gives a diagram. The trunk of the central artery passed forwards, without dividing, as far as, or beyond, the level of the retina towards the vitreous, and then gave off four branches about at right angles to each other. This arrangement probably afforded increased resistance to the flow of blood, and led to spontaneous pulsation. In the frog's mesentery in arteries of a certain calibre, no pulsation was visible, but if the slightest obstruction existed locally, then vessels of a small calibre were seen to pulsate. He also narrates a case of detached retina in which he saw pulsation in an artery, which was lifted up, when he confined his attention to a point just before its bifurcation. He discusses the question as to *why spontaneous pulsation is always present in aortic insufficiency*. In these cases the dilating pulse wave becomes exaggerated, and a sudden subsidence occurs owing to regurgitation into the left ventricle. Experiments are also described which were undertaken in dogs. The aortic valves were rendered incompetent. The following statement is made with reference to the *best means of ascertaining whether spontaneous pulsation is present or not*. It is more easily seen at a point just before a division occurs, and the more easily the greater is the angle at which the branch is given off. It is more frequently seen in the neighbourhood of the disc than in the periphery. The elongation of the artery, the increase of the length of a curve, and of the serpentine appearance, and the movement onwards of the artery, can be more easily seen in the periphery of the retina; in the smaller arteries therefore, and, under special circumstances only, on the disc. He enters in detail into the advantage of observing the light-streak on the

artery in estimating an increase in the breadth of the vessel, and also into the explanations which have been offered of the phenomenon of the light streak. He discusses the influence of increased pressure (by the finger, &c.) on the retinal vessels. The venous pulse and the arterial pulse in glaucoma are improperly so-called. The true arterial pulsation is really an intermittent flow of arterial blood into the eye; the venous pulse depends on the varying local pressure to which a stream of blood is subjected at different times. He confirms Mauthner's statement that the walls of the vessels on the disc and on the retina can be seen. This was almost always ascertained in the cases of aortic insufficiency.

In an appendix to his paper, Becker describes the phenomena of the circulation in the vessels of the disc in dogs to which attention has been called by others, and which he has also observed.

He also discusses the systolic blush and diastolic pallor of the optic disc, which he had only latterly succeeded in verifying. Owing to the practical skill in the use of the ophthalmoscope, and the willingness to see which are required in order to ascertain the presence of pulsation in the eye, the author is afraid it will yet be a long while before cases of aortic insufficiency will be diagnosed, first of all, by the ophthalmoscopist, as is so often the case with kidney disease, &c., now-a-days.—(Graefe's Archiv. 18 B. Abth. i, pp. 206—296.) (See *post* case by Fitzgerald.)

THE POSTERIOR LYMPH-PASSAGES OF THE EYE.

Dr. Julius Michel gives an account of the results of injections which he has made, accompanied by illustrations of the microscopic appearances, &c. He sums up to the effect that the sub-vaginal space communicates with the supra-vaginal space by means of slit-like gaps in the outer nerve-sheath and in the perichoroidal space by means of similar gaps in the sclerotic. The latter communicates by means of the perivascular spaces around the *venæ verticosæ* with Tenon's space; so that portions of injection which have passed, on the one hand, through the openings in the optic sheath, and, on the other hand, through those in the sclerotic, meet together in Tenon's space, or in the supra-vaginal space immediately connected with it. These spaces are all, since the researches of Schwalbe, to be regarded as lymph-spaces. The demonstration of the fact that the slits in the outer nerve-sheath and in the sclerotic, as described, represent means of communication between these spaces, and are lined with endothelial plates, justifies the opinion that they are to be regarded as serving for the passage of the lymph. The causes of certain forms of disease of the eye may be explained by the above facts, if the outflow from the lymph passages and spaces of the eye into the reservoir of the sub-dural space be obstructed on the one hand, and on the other, if the communica-

tion of the spaces with one another be partly interfered with. Such affections, for instance, as the complication of certain forms of neuritis with choroiditis may be so explained. Possibly also, the origin of myopia may be explained by the above facts in such cases as Kugel has noted. He observed myopia develop acutely after meningitis, and attributed the lengthening of the eyeball to the inability of the sclerotic to withstand the ordinary ocular pressure owing to changes which had taken place in it.—(Graefe's Archiv. f. Ophth., 18 B., Abth. 1, p. 127.)

PIGMENTARY DEPOSITS IN THE CORNEA.

Dr. Hirschler calls attention to a peculiar kind of deposit of pigment which he has met with in the cornea. His attention was first called to dark spots which he noticed appear in the corneæ during the retrogression of diffuse parenchymatous keratitis, and which he regarded as mere transparent portions, circumscribed gaps in the parenchymatous cloudiness. Later observations have induced him to think them accumulations of pigment in the deeper layers masked by the more superficial haze. In three corneæ which he had the opportunity of observing lately, he was convinced this was what occurred. He gives detailed notes of two cases. This pigment occurs in those places which are indicated by the presence of more numerous and larger newly-formed vessels, and therefore more particularly on parts near the centre of the cornea, and in small quantity in parts at a distance. It forms irregularly-margined spots or disks with four or more angles of the size of a small pin's head or 2 mm. (.08") in diameter, or sometimes the spots may be quite circular. The colour is of a deep black, but when looked at from the front the deposits appear less deeply coloured, owing to the haze through which they are seen. If the latter is absent, then the black spots can scarcely escape observation in moderately clear daylight. By focal illumination under all circumstances they can be more closely examined. They are then seen to be situated about midway between the anterior and posterior surfaces of the cornea. When the infiltration of the cornea has become re-absorbed, these pigment deposits become so apparent that they may look like bits of coal-dust on the cornea. Under a magnifying power of 20 diameters, the deposits appear made up of a collection of several smaller spots. The centre of the spot is sometimes of a deep black, surrounded by a rusty-brown or deep-red circle; sometimes it is less deeply coloured than the periphery, and is then of a rusty-brown colour, making the whole spot resemble an irregular ring. In one spot, at a somewhat higher level, a deep-red border could be distinguished, but whether this was due to an effusion of blood or to a loop of vessels could not be determined. There can be no doubt that this

deposit of pigment originates from altered hæmatin, and consequently from antecedent effusion of blood into the parenchyma of the cornea. Additional evidence in favour of this was afforded by the presence of newly-formed vessels.

The two cases related, though differing in mode of appearance and in their course, agree with the typical examples of the affection in question, inasmuch as in both the disease began at the periphery and extended over the whole cornea, and deprived this for a long time of its transparency; that in both a rich vascularity appeared; and that, finally, the duration was very protracted. In both cases there was slight iritis. In one case a rather considerable corneal staphyloma in both eyes resulted from the keratitis. In both cases Pagenstecher's salve was used for more than a year. The pigmentation was first noticed after this remedy had been used for some time. The first patient was a man aged 24, who suffered from diffuse parenchymatous keratitis, serous iritis, and pigment deposits in both eyes. The second patient was a married woman aged 29, who suffered from parenchymatous keratitis, episcleritis, iritis of each eye, and pigment deposits in the left eye.—(Græfe's Archiv. f. Ophth., 18 B., Abth. 1, p. 186.) (See *post* Iritis Pigmentosa.)

METASTATIC IRIDO-CHOROIDITIS.

Prof. Hermann Schmidt relates two cases of metastatic irido-choroiditis attended with the formation of a circumscribed collection of pus after perforation of the sclerotic had taken place. He considers this to be a very rare occurrence. One patient came under care in the Charité Hospital at Marburg. The other was only seen a few times during life. The symptoms in the two cases were much the same. In the first case the patient had for long been the subject of phthisis, and was much reduced. His left eye was affected with irido-choroiditis. The most prominent symptoms were rather slight chemosis, and moderate protrusion of the eyeball. The cornea and the anterior chamber, excepting the presence of a very small hypopyon, were unaffected. The pupil was blocked up. Qualitative vision was lost. After some days, during which the chemosis and injection of the conjunctiva had, on the whole, diminished, a tumour of the size of a lentil or of a pea, and of yellowish colour, made its appearance at the inner canthus in the neighbourhood of the insertion of the internal rectus, and apparently situated close under the conjunctiva. An attempt was made to open the supposed abscess by a snip with a pair of scissors; but, after cutting through the conjunctiva and subjacent tissue, as no pus escaped, any further proceeding was abstained from. The inflammation gradually subsided, the tumour became very small, and the eye resumed its normal appearance, with the exception of the state of the pupil.

The sight was still lost. A few days later the patient died of tuberculosis. The subject of the second case was a man, aged 52, who was admitted for extensive suppuration of the left side of the neck, and suppurative inflammation of one knee-joint. The left eye had become inflamed the day previously, and showed evidences of iritis. He could distinguish the hands of a clock. On the fourth day moderate exophthalmos and slight œdema of the conjunctiva came on. On the ninth day the eyelids were slightly reddened and somewhat œdematous; the conjunctiva over its whole extent was abnormally injected and infiltrated with serum (chemosis). The eyeball was rather prominent. At the inner angle of the eye was a tumour, rather larger than a pea, projecting under the conjunctiva which, at one part, had a slightly yellowish colour. The cornea was clear, the anterior chamber tolerably transparent, but at the bottom was a hypopyon. The iris at the margin of the pupil was completely adherent all round, and the latter was covered over with a greyish membrane. The globe was rather more tense than natural, and, at some parts of the ciliary region, was sensitive to pressure. Vision was limited to quantitative perception of light. The diagnosis of suppurative irido-choroiditis was made. The nature of the boss-like tumour was doubtful. It might be a circumscribed inflammation and infiltration of the subconjunctival tissues, or it might be a collection of pus encapsuled after perforation of the sclerotic. In neither case was an incision contra-indicated. A snip with the scissors did not let out any pus. On the fourteenth day a similar result followed another cut. In the meantime the œdema and the exophthalmos gradually subsided, and the anterior chamber became clearer. On the twenty-second day the patient died. The *post-mortem* revealed extensive suppuration in the left side of the neck, purulent inflammation of the right knee-joint and adjacent subcutaneous tissue; peri-articular abscesses in both elbows, and abscesses in the kidneys. In the left internal jugular vein was a suppurating broken-down clot, which passed up to the jugular fossa and into the left lateral sinus as far as the torcular herophili. The ophthalmic vein was not affected. Under the tendon of the left internal rectus, 7 mm. (.28") from the corneal border was a tumour about the size of a pea, which, when cut into, proved to be an abscess cavity, communicating with the interior of the globe by an opening in the sclerotic. The walls of the abscess consisted of dense, strong, connective tissue. Its floor was formed by the sclerotic, which was rough and somewhat depressed, and it had the form of a triangle, whose apex passed towards the cornea. The perforation was almost in the middle of the triangle, and measured in diameter 2 mm. (.08"). Evidences of suppurative inflammation were found in the choroid and retina, the ciliary region and the vitreous, &c., and an exudation was found on Descemet's membrane. The optic nerve trunk

was normal, but its intra-ocular portion was smaller. A detailed description of the microscopic appearances is given. The examination confirmed the account given by Knapp (*Metastatische Choroiditis Archiv. f. Ophth.*, 13 B., Abth. 1, p. 127). Important differences between the present case and Knapp's consisted in the high degree of intra-ocular optic neuritis, which was found, without special changes in the lamina cribrosa and the complication of the changes met with in Descemet's membrane. The most interesting peculiarity of all, however, was the perforation of the sclerotic, and the localisation of pus in a capsule externally. Cases of perforation of the sclerotic in choroiditis are quoted, but without localised collection of pus externally. Remarks are made on the classes of cases in which metastatic affections of the eye are met with. Special weight is attached to the fact that we commonly see this form of irido-choroiditis depending on emboli. In addition, the author makes a few remarks on the combination of the symptoms of one-sided exophthalmos, and of hyperæmia and œdema of the conjunctiva, of the orbital cellular tissue and of the eyelids as *indicative of thrombosis of the cerebral sinuses*. Various authors have asserted the pathognomonic character of this group of symptoms in reference to thrombosis. Prof. Schmidt thinks that not unfrequently the symptoms may be due to the choroiditis. In some cases it is certain that no irido-choroiditis has occurred. Knapp mentioned one symptom which has since been overlooked, which decisively excludes the presence of irido-choroiditis, namely, a wide and motionless pupil. It is only when combined with this symptom that exophthalmos, chemosis, and œdema of lids can be considered pathognomonic of thrombosis of the cerebral sinuses.—(*Græfe's Archiv. f. Ophth.*, 18 B., Abth. 1, p. 18.)

GLAUCOMA.

L. Rydel contributes a paper on this subject. He details a case in which a man who had suffered from symptoms of glaucoma for three weeks, suddenly lost the sight completely in one night. He explains this as due to increase of pressure shutting off arterial supply and paralysing the retina. He agrees with Græfe that the blindness in acute glaucoma is due chiefly to ischaemic paralysis of the retina. The author thinks the same explanation applies to variations in chronic glaucoma. Cases of deep excavation with slight defect of sight are wholly exceptional, but possibly analogous to cases in which the brain becomes adapted to slow pressure. He discusses the question of concentric narrowing of the field. The defect beginning in the ends of the nerves at the outer half of the retina, he explains by the distribution of the vessels and the position of the disc. The inner half of the retina is more richly supplied with blood than

the outer, and the vessels to the outer half have a longer course. He quotes Poiseuille's laws as to the influence of the length and size of vessels on the quantity of blood passing through them. For the exceptional cases of glaucoma in which the temporal side of the field fails first, he has no explanation to offer. In regard to the subjective sensations of light of which aumautotic, glaucomatous patients complain, he remarks on the probability of their being explained by oscillations in the amount of blood-supply. At one time there is less pressure, as we know by the tension, more blood is supplied, and this irritates the nerve fibres. They may at the same time be quite unaffected by rays of light falling on them. He alludes, in passing, to the great changes which occur in the tension of glaucomatous eyes even within a few hours.—(Græfe's Archiv. f. Ophth., 18 B., Abt. 1.)

NEURO-RETINITIS WITH CEREBRAL TUMOUR.

Dr. J. Rosenbach details at great length a case of neuro-retinitis with cerebral tumour (glioma). Illustrations of the results of the microscopic examination of the retina, &c., are given, and their bearings on the researches of Pagenstecher, &c. The patient was a man æt. 30. He had pain in the head, vomiting, drowsiness passing into coma, &c. The left eye was the one chiefly affected. The vision of the right eye was good (1 J., & $\frac{2}{4} \frac{0}{0}$), and that of the left much diminished ($\frac{2}{2} \frac{0}{0} \frac{0}{0}$ & 3 J). The left disc was congested; its borders were ill-defined, and covered with a whitish haze, passing into the adjoining retina. The whole appeared swollen. The arteries were not narrowed; the veins were dilated and tortuous. Below and externally (inverted image) was a fine streak of hæmorrhage. The macula lutea was not altered. In the right eye there was a slight cloudiness about the disc. There was no albumen in the man's urine. Later on it was noticed that though he could pick up a pin, he could not mention the names of the largest letters. He died about two months after the commencement of the symptoms. The tumour was situated in the brain substance at the floor of the left lateral ventricle, pushing the corpus striatum forwards and the thalamus backwards, whereby pressure was exercised on the corpora quadrigemina. Between the floor of the lateral ventricle and the tuber cinereum it formed a mass which was well defined from surrounding parts. It was of a clear, yellowish-grey colour, and of somewhat harder consistence than that of the brain substance, the latter being softened and thinned. The tumour was a glioma. In the detailed account of the microscopic examination of the optic discs, &c., special attention is called to a *meshwork* which he found, resembling in some degree that of a bath-sponge, and of which he gives an illustration. The meshes were oval and divided from one another by septa of varying thickness. He

made many sections to ascertain whether this meshwork was formed by bundles of connective tissue pushed aside by hypertrophied nerve fibres, or whether they were due to exudation. He found they were filled with a finely-granular homogeneous substance, resembling coagulated lymph. The diameter of the spaces was from three to five times that of the thickest varicose nerve swellings. He particularises the fact that, besides the generally increased intra-cranial pressure, there was a special pressure exercised on the parts in and about the sella turcica by the tumour itself, and the floor of the lateral ventricle was pushed down by the increase in its contents, and that the left optic nerve, which was most compromised by the tumour, was the one most affected during life.

In answer to the question as to the exact connection between the tumour and the ocular changes in this special case, the author thinks there are several theories to choose from. He selects Herr Schmidt's, which depends on the pressure exercised on the contents of the fibrous sheaths of the optic nerve from the neighbourhood of the tuber cinereum. From this cause there results increased pressure on, and stowing of lymph between, the two sheaths and in the lamina cribrosa. A distension of the small vessels in the neighbourhood (disc, &c.), is a necessary consequence. The results of the removal of atmospheric pressure from any locality of the body may be adduced in comparison.—(Græfe's *Archiv. f. Ophth.*, 18 B., Abt. i, p. 31.)

CONTRIBUTIONS TO OPHTHALMOTONOMETRY.

An elaborate paper, with tabulated summaries, on the tension of the eyeball under various conditions is communicated by Dr. Pflueger to the *Archiv. für Ophth. and Otol.*, vol. ii, No. 2, pp. 91—153. He confirms the statement that, as a rule, atropine diminishes tension. That it increases tension except with iritic adhesions or in glaucoma, is highly questionable. In some few cases its effect does not become manifest.

THE OPHTHALMOSCOPIC IMAGE OF THE LARGE RETINAL VESSELS.

Dr. Schneller passes in review the explanations adopted by Jäger, Loring, and others. He is not satisfied with them. He attributes the light streak on the retinal vessels to a reflection, by the anterior wall of the vessel, of the image of the flame reflected by the mirror. He also enters into an explanation of the differences of the light streak as seen on arteries and veins. In a case of optic neuritis from lead poisoning he had been led to attribute the light streak to spasm of the vessels.—(Zehender's *Klin. Monat.*, p. 240, 1871.) (Græfe's *Archiv. f. Ophth.*, 18 B., Abth. i, p. 113.)

OPTIC NEURITIS FROM LEAD POISONING.

Dr. Schneller (Zehender's *Klin Monat.*, 1871, p. 240) records a case of optic neuritis from lead poisoning. The patient was a house painter, æt. 44, strong, and of dark complexion, whose hair was turning gray. As an apprentice he had suffered from an attack of lead colic. Four years previously he had had a chancre, not followed by any secondary symptoms. He was a smoker. Latterly he had been employed in grinding lead colours, without taking any precautions. Eight days before he had complained of defect of sight. He had M. l. $\frac{1}{50}$, r. $\frac{1}{28}$; V. l. $\frac{11}{100}$, r. $\frac{12}{20}$. Colours, so far as could be tested by coloured papers, were correctly distinguished. The peripheral field of vision was unaffected. The pupils were somewhat dilated. Ophthalmoscopically the discs were considerably reddened, not swollen, slightly hazy; the borders were a little indistinct (left, above, inner side and below, the right only below), being covered by a slightly reddish layer, which caused the retinal vessels to be almost imperceptible in places. The haziness only extended very slightly beyond the borders of the discs. The arteries were very tortuous; the veins resembled the arteries in thickness and appearance (having a central light streak and two red lateral ones) so much that they could only be distinguished from them with difficulty. In other respects the fundus in each eye seemed normal. There was a bluish line on the gums which appeared retracted from the teeth. After the applications of leeches on two occasions the sight did not improve. The treatment consisted in purgatives, iodide of potassium, protective glasses, and cessation from occupation. At the end of a month the patient resumed work without taking any precautions, and in spite of warning. In two months, date of last note, it is said the veins had gradually become dilated, and appeared more normal, that is, the light streak was less marked. The arteries were less tortuous, but more so than normal. The discs were paler, scarcely at all reddened or blurred at the margins. About eighteen months before, Dr. Schneller had seen a similar case in a painter. He had congestion of the discs and slight haziness, without dilatation of retinal vessels. He remarks that he considered the optic neuritis proved by the presence of redness, alteration in the margins of the disc, and slight cloudiness of its substance and the immediately adjoining retina. The second point distinguishes this form from choroidal hyperæmia, the third from that of simple hyperæmia of the discs.

That this optic neuritis proceeds from lead poisoning is proved by the occupation, the bluish-gray line on the gums, the costive stools, the grayish cachectic colour of the skin, the relapse on resuming the occupation without precaution, and the absence of other etiological influences. These peculiarities appear in con-

nection with tolerably marked congestion of the discs—without disease of the choroid and retina—with slight haziness of the optic disc, with slight differentiation between the veins and arteries, and with marked tortuosity of the arteries.

The changes in the veins, which, together with the tortuosity of the arteries, disappeared as the other symptoms receded, could not be due to thickening of the walls of the vessels, for there were no accompanying whitish streaks. Neither could they be due to diminution of the blood-pressure in the retinal arteries, as these did not contain less blood than usual. They are therefore to be ascribed to a morbid condition of the vascular muscular tissue, which is analogous to the symptoms of lead colic. This may produce a stagnation of blood and congestion of the capillaries and arteries of the retina, which may share in the congestion of the disc, and may at all events produce the tortuosity of the arteries, whilst it is not sufficient to dilate the arteries.

ENGORGED OPTIC DISC IN CONSEQUENCE OF SOLITARY TUBERCLE IN THE CEREBELLUM.

By Dr. Hirschberg. The patient was a girl, *æt.* 3 years. Headache, inclination of the head backwards, and to the right, drowsiness, languor, and inability to stand on her feet were the chief symptoms. The head gradually enlarged. In the right half of the cerebellum was found a hard, dry, yellow, cheesy mass, as large as an apple, composed of concentric laminæ, and containing at its centre a focus of white detritus. The left half of the cerebellum was attached to the basis cranii by means of a white cheesy mass as large as a walnut.—(*Archives of Ophth. and Otol.*, vol. ii, No. 2, p. 26.)

ANATOMICAL RESEARCHES ON TYPICAL RETINITIS PIGMENTOSA.

Dr. Landolt narrates two cases of retinitis pigmentosa. The first patient was a man. In both eyes there were anterior and posterior polar cataracts, a few delicate films in the vitreous, complete atrophy of the optic nerves, the vessels were much diminished in size, their walls were partially apparent as white streaks, but in the periphery no vessels could be detected. The retina throughout the whole equatorial region, extending to the neighbourhood of the disc and some distance into the periphery, was beset with dark pigment arranged in the form of a network or of bone corpuscles. The layer of pigment epithelium was almost devoid of pigment. At isolated points only were there roundish or annular heaps of pigment. There was no evidence of exudation or other change underneath this layer. *His parents were not related*, and did not suffer from any eye disease, nor did

his brothers and sisters, with the exception of one sister who had become quite blind from glaucoma. The first symptoms were noticed when he was fourteen years old. He then suffered from hemeralopia, but could still read and write. When twenty years of age his sight only enabled him to find his way about. When seen, his vision only amounted to incomplete perception of light and dim vision of large objects. He could not distinguish people at all. He became very anæmic, and died of cirrhosis of the liver and kidneys. Careful microscopic examinations of the optic nerves, retinae, &c., were made. The second patient was also a man, aged 39. The parents were not related, and no member of the family suffered from eye disease. He had always had defective sight, and from the age of eighteen had been completely blind. The ophthalmoscopic appearances were those of typical congenital retinitis pigmentosa. The patient became anæmic and dropsical. There was no apparent disease of the heart, and only a trace of albumen in the urine, and the latter gradually disappeared. At the *post-mortem*, general wasting, with chronic interstitial nephritis, &c., were found.

The following is a brief summary of the results of the examination of the two cases. The chief changes were found in the retina; almost total disappearance of the nervous elements and of the rods and cones; a very high degree of hyperplasia of the existing connective-tissue, and the formation of new connective-tissue in the connective-tissue frame work and in the walls of the vessels. The latter were much thickened, their calibre diminished and their finest ramifications completely degenerated into connective-tissue. Their walls contained masses of pigment which had either migrated from elsewhere, or was an endogenous production, and was partly enclosed in cells and partly free. The pigment had in great part vanished from the epithelial layer, and was collected in isolated positions along the course of the retinal vessels. In the choroid in the first case, thinning of the capillary vessels and pigmentary infiltration of the same were found, as well as an abnormal fusion of the layers together. The portion of the vitreous nearest to the retina was altered in structure, infiltrated with colourless blood-cells and with pigment granules, and in the second case, was too fluid. The lens was affected with polar cataract. These changes do not differ from those met with in other cases which have been examined. No glandular excrescences were found in the choroid, as described by Leber. The choroidal changes were very slight, and this fact showed that they were really cases of retinitis pigmentosa. The changes found, all pointed to a *chronic inflammatory process which was chiefly situate in the retina, and more particularly in the vessels of the retina*. The walls of the peripheral retinal vessels become inflamed, their connective tissue hypertrophied, and, at the same time also, hypertrophy of the surrounding connective-tissue is set

up. The nervous elements disappear, owing, at first, to pressure and, later, to failure of nutrition, dependent on narrowing of the calibre of the vessels. The retinal function is abolished. The process gradually encroaches on the central parts, the field of vision becomes narrower and narrower. No symptoms of stasis develop, because the process is so gradual. The morbid process extends more deeply, the epithelial layer immediately under the vessels becomes first affected, the pigment passes forwards along the passages of new connective-tissue formed by the inflammatory process. When once it has arrived at the wall of a vessel it may either pass further or form collections of pigment there. The latter occurs the more readily owing to the altered blood pigment present in the obliterated vessels. The further steps of the process are given in detail. The last of the inflammatory changes is the polar cataract, due probably to the abnormal state of nutrition of the vitreous. The choroid need not share in the process, but if we find glandular excrescences from the part lying immediately under the diseased retina, we need not be surprised. In the same way we are not astonished to find, as in the second case, that the walls of the choroidal vessels are affected in a similar way if once the disposition to inflammation of the walls of the vessels is present. The thickening of the walls of the retinal vessels found on microscopic and ophthalmoscopic examination tends to support the view that retinitis pigmentosa is a very chronic peri-vasculitis of the retinal vessels. The cases of retinitis pigmentosa without pigmentation support the same view. In these the process is confined to the inner layers of the retina, yet the objective and subjective results are the same. Perhaps the morbid process in retinitis pigmentosa may be compared to that in cirrhosis of the liver or kidneys. The first patient died of cirrhosis of the liver, the second of chronic interstitial nephritis associated with changes in the liver and spleen.

The author alludes to the results of the experiments of Dr. Berlin, who divided the optic nerves in frogs and guinea-pigs.—(*Zehend. Klin. Monat. A.*, ix, s. 277.) Not only atrophy of the cell-elements of the retina followed, but also the pigment partially disappeared from the epithelial layer, and passed into the innermost portions of the retina. The changes were therefore similar to those met with in retinitis pigmentosa. There was no marked hypertrophy of the connective-tissue however, and the granular layers as well as the rods and cones were preserved. These experiments are perhaps rather of value as showing in what way the pigment may reach the retina. It must not be forgotten, however, that the vessels were divided at the same time as the optic nerve. The results of this double section cannot be estimated apart from one another. Illustrations accompany the paper.—(*Graefe's Archiv. f. Ophth.* 18 B. Abth., i, p. 325.)

EFFECTS OF DIVISION OF THE OPTIC NERVE.

Dr. Berlin spoke of division of the optic nerve. He had experimented on frogs and rabbits. His results were the same in each. He divided the nerve from the outside, by which means the ophthalmic artery, as well as the central artery of the retina, were simultaneously cut. The perfectness of this division may be ascertained with the ophthalmoscope, by the fact of the choroid losing its colour. The blood in the veins of the hyaloid membrane moves to and fro, dependent upon the respiratory movements, until, in a few days, the normal circulation is re-established. The pupil contracts immediately after the operation, but after the third day again dilates. From the second day on, marked changes in the fundus are perceptible; the latter becomes of a grayish-white, milky colour, the blood-vessels remaining distinctly visible. The retina is streaked very perceptibly in a radiating manner. The examination of the eyes, which was made at a varying length of time after the operation, showed the nerve fibres to be granular and the retina attenuated, particularly at the expense of the fibrous, ganglionic and molecular layers. The fibres of Müller resist the longest, and the rods always remain uninjured. The extent of the atrophy varied in different portions of the same retina. Throughout the whole retina the deposit of pigment was very large. This was accompanied step for step by a corresponding decolorisation of the choroidal epithelium, and hence was dependent upon the latter. No signs of inflammation of any kind appeared during the process of atrophy and pigmentation.—(Dr. Knapp's Report of German Ophth. Congress, Archives of Ophth. and Otol., vol. ii, No. 2, p. 194.)

A CASE OF FORMATION OF PIGMENT IN THE RETINA IN CONSEQUENCE OF RETINAL HÆMORRHAGES.

Dr. Hersing (Zehend. Klin. Monat. x, p. 171, with an illustration).

CASE OF CONGENITAL RETINITIS PIGMENTOSA.

Dr. Harlan records the case of a girl, æt. 18, who had always had defective vision. She had decided hemeralopia. The eyes oscillated constantly. The field of vision was very much contracted, and this explained her statement that she could often not see objects at all without looking at them from a distance, and then could only see distinctly by coming close to an object. At a distance she could obtain a general view indistinctly, whereas when she was close to an object her field was so contracted that she might miss it altogether. The image of a small object would completely occupy the sensitive part of the retina,

and could only be seen when it fell exactly on the macula lutea. The ophthalmoscope showed the changes characteristic of retinitis pigmentosa. There was no consanguinity between the parents, no history of hereditary blindness, and no indication of hereditary syphilis. The patient thought that her sight had improved rather than become more defective since childhood.—(Am. Journ. Med. Sci., July, 1872, p. 130.)

GENERAL CHRONIC HERPES ZOSTER—ATROPHY OF THE OPTIC NERVES—FURIOUS DELIRIUM.

Dr. Hubsch records an interesting case. The patient was a gentleman, æt. 52, at the date of the last note. He was born when his father was advanced in years, was at all periods old for his age, and became a distinguished linguist, &c. When forty years of age he suffered from pain in the back, at first located to one part, and relieved by friction or pressure, but in about a year extending widely. He could not bear the weight of his clothes, nor the friction of linen on the body. At last he noticed small rose-coloured elevations appear on the skin, of the size of a grain of sand or of a millet seed, arranged in groups taking a circular form, and of which each group, consisting of many hundreds joined together, formed a kind of ring. At first distinct, and scattered sparsely, here and there, these rings finally became greatly increased in number, packed closely together, fused into one another, and occupied a very extensive tract of skin. A patch of them of the size of the hand could be seen to cover part of the back, symmetrically, at an equal distance from the spine on either side. The appearance of the first two groups was preceded and accompanied by excruciating pain and hyperæsthesia of the skin. The eruption, consisting of hard elevations, pale at first, but gradually passing into a bright red colour, and becoming increased in size, so as to attain a height of a millimeter ($\cdot 04''$) above the level of the skin, generally terminated in exfoliation, the skin resuming its normal appearance. Each fresh outbreak was preceded by pain, which lasted 24—36 hours, when the skin became reddened and the eruption appeared. The groups would remain for three or four days, and then desquamate. The patches always appeared on both sides of the spine symmetrically. After a time the skin over the shoulder blades and over the sacrum became affected, and for a year the rash did not spread further. Then it appeared on the buttocks, thighs, abdomen, front of the thorax, the anus, fore-arms, and face in succession. MM. Hardy and Bazin, who saw the patient, gave no definite diagnosis. Professor Hebra designated it "chronic herpes zoster." The patient stayed some months in Vienna, and while there noticed that his sight was failing. He improved somewhat in other respects. M. Hubsch on his return (to Constantinople) found a posterior staphyloma in each eye, and also

commencing atrophy of the discs. The failure of sight proceeded rapidly. He was seen by v. Græfe, who confirmed the diagnosis of atrophy of the discs. The patient remained in a more or less quiescent state for six years more. Outbreaks of eruption of a similar character to the others occurred repeatedly. At the end of that time he lost appetite, his strength failed him, his spine became crooked, and he passed into a state bordering on stupefaction. After a time he became furiously delirious, a straight jacket had to be applied, and finally he was sent to an asylum. He lived on, with occasional intervals of calmness, till the time at which the communication was made.—(*Annales d'Oculistique*, Mai-Juin, 1872, p. 239.)

PARALYSIS OF THE TRIGEMINUS FOLLOWED BY SLOUGHING OF THE CORNEA.

Dr. Norris records the case of a man *æt.* 42, who applied for soreness of the left eye, of one week's duration. He had a large epithelioma of the left angle of the mouth. There was slight drooping of the lid, without other muscular paralysis; loss of sensation in the cornea, &c.; impairment of the sense of taste on the left side; slight paresis of the facial nerve on the same side; and marked deafness on the same side. The conjunctiva was congested, there was slight bullar chemosis and a punctate keratitis, most marked at the centre of the cornea. In a month the eye, in spite of all care, became worse, but then improved a little. In six weeks from his first coming under care, the epithelioma, which had existed for some months, was removed. The patient died a month later, at home, and no autopsy was allowed. The interest of the case lies in the fact that, though the patient was seen early, and in spite of the most sedulous care in cleansing the eye and protecting it from external irritants, necrosis and perforation of the central portion of the cornea could not be prevented. A summary of the researches and views of Græfe, Snellen, Meissner, Sinitzin, &c., is given.—(*Am. Journ. Med. Sci.*, Jan., 1872, p. 80.)

ANOMALOUS CIRCULATION IN THE EYE.

Dr. Loring records three cases of anomalous circulation within the eye, probably produced by morbid processes. "It is certainly a very curious and, at the same time, very interesting fact that, though from the anatomical labours of Zinn, Jaeger, and Leber, an anastomosis between the choroidal and retinal vessels has been supposed to exist (at least, in the immediate neighbourhood of the nerve), no such anastomosis has ever been actually seen with the ophthalmoscope." The first patient was a young man, of sound bodily health, who came under care for

slight æsthenopia of one eye. The ophthalmoscopic appearances seemed, at first sight, to be those of rupture of the choroid, but ultimately the disease was considered syphilitic. It was not a congenital affection. There was a large patch of atrophy of the choroid at the region of the yellow spot, and evidences of past perivasculitis along the vessels. The most interesting feature was the remarkable behaviour of one of the lower principal veins. "This, as a glance at the plate will show, ascends towards the nerve in the normal manner till it reaches a point about two diameters of the disc from the edge of the nerve, where, instead of continuing on in the natural way, it makes a sudden bend at a comparatively acute angle, and then runs in the same direction with, and parallel to the neighbouring artery, the currents of the two vessels moving in the same direction. After making a sweeping curve upward, this part of the vein is joined by another large branch coming from the left of the field, and the two then uniting to form one trunk, this latter passes directly upwards, crosses over the artery, and then comes to an abrupt end, its point of termination being masked, in a provoking manner, to a considerable degree, by a spot of pigment lying over the vessel." As, however, neither the main trunk of the vessel, nor any branch thereof, makes its appearance in any part of the fundus, one of two things must take place, namely, either the vessel pierces the sclera, thus making for itself an independent exit from the eye into the orbital cavity, and uniting there with some orbital vessel, or it forms, sooner or later, some anastomosis inside of the eye with one of the larger choroidal vessels. If it be true, as Leber asserts, that there are no veins which empty out of the posterior part of the eye, then it is extremely improbable that this vessel should so far violate the law as not simply to enlarge an exit already existing, but to bore for itself an outlet through so dense and resisting a tissue as the sclera; while, on the contrary, there is certainly little against the supposition that the vessel should join one of the choroidal veins. "It is probable that the principal trunk of the vein lay in the very focus of the inflammatory action, and was by this completely destroyed, and subsequently absorbed down to the apex of the angle formed by the sudden bend in the vessel. Thus its connection with the nerve, as is obvious from the drawing, is entirely cut off for a considerable distance, not a vestige of the vessel or its remains being visible with the ophthalmoscope." That the venous current at one part flowed in just the opposite direction from what nature intended it should was undoubtedly the case. "Thus we have two exits for the venous circulation of the retina, one at the optic disc, the other at the seat of the injury." The second patient was a middle-aged woman, suffering from glaucoma. After iridectomy had been performed, "a deep gray opacity in the retina extended from the outer edge of the

optic nerve to the macula, which appeared as a blackish oval spot. Through this gray opacity, and occupying a part of the retina usually free from vessels, ran a branch from one of the principal trunks of the central artery. This vessel was of a considerable size, and pursued an exceedingly tortuous course, twisting in and out in a remarkable manner, till it finally doubled on itself, returning nearly to where it started from, and then passed out of view in the extremity of the field. In about the centre of the convoluted part this arterial branch was joined by a short trunk of about equal or a little larger calibre with itself, which seemed to come up in a sort of rounded arch-like projection from some vessel lying in the deeper tissues either of the retina or of the choroid, and by means of which the size of the tortuous vessel was increased, not only at the point of juncture, but also for quite a distance beyond." A figure is given.

The third patient was a young girl suffering from progressive myopia, the result of over-work at school. "The atrophy, as it progressed, had spared what either was originally, or had become a vein of considerable size. This vessel, taking its origin from the upper and inner part of the field, ran downwards and outwards, as if to pass out with or join one of the other vessels at the centre of the disc. After passing over the atrophied portion, however, and just before it reached the true border of the nerve, it made a sudden turn, and was then traceable directly into what was evidently a choroidal vessel. At the point of bending there was what seemed to be a faintly perceptible pulsation, and the lower portion of the vessel seemed to be on a plane posterior to its other portion, as if here the wall of the eye was, in fact, slightly staphylomatous." "Here, as in the first case, one of two things must hold good—either the vein pierces the sclera, and thus makes an outlet for itself, or it joins with one of the choroidal vessels, as really seemed with the ophthalmoscope to be the case."—(*Archives of Ophth. and Otol.*, vol. ii, No. 2, p. 1.)

STRYCHNIA AS A RETINAL AND OPTIC NERVE STIMULUS.

Dr. Chisholm refers to papers by Prof. Nagel (contributed to *Centralblatt* Dec. 24, 1870, and *Berlin Med. Woch.*, No. 6, 1871, analysed fully in *Med. Times and Gaz.*, Jan. 21 and April 15, 1871) on strychnia as a remedial agent in amaurosis. The cures reported by Prof. Nagel seemed scarcely credible. Dr. Chisholm has often seen good result from administration of strychnia in hemeralopia. One patient who had been treated long and carefully by other physicians, who could not even see a gas light at night, after a few subcutaneous injections, was able to read a newspaper by the same gas light. Three patients presented themselves simultaneously, and were equally relieved by hypodermic injections of strychnia. Dr. Chisholm tried the

remedy in a case of extensive disease of the choroid and retina. The patient had applied for treatment on a previous occasion, and had been dismissed as hopelessly incurable. He was a man aged 52. The choroid and retina were extensively diseased. He could only distinguish light with one (the better) eye.

On the 16th of September one-fortieth of a grain of the sulphate of strychnia in ten minims of water, was injected under the skin of the arm night and morning. The effects were immediate. A few minutes after the very first injection, the enveloping fog seemed less to him. "After three days" the patient could see large objects about the ward, and "on the fourth day" of treatment, without help, he succeeded in walking through the streets home. At the end of six weeks, after having averaged, during that time, about three injections in forty-eight hours, and when the improvement in vision had been steadily progressing, he could make out the large type heading of the daily papers, and could walk alone in the streets. About two grains of strychnia had been used. In other cases of optic nerve atrophy, the effects have been as marked. Generally, Dr. Chisholm commences with a sixtieth of a grain gradually increased to a thirtieth twice daily. In no case has the last amount been exceeded. In functional disturbances the relief is very prompt; in organic mischief the results show themselves more slowly.—(Am. Journ. Med. Sci., Jan. 1872, p. 59.)

ON THE USE OF STRYCHNINE IN OPHTHALMIC PRACTICE.

Dr. Gori (Annales d'Oculistique, Sep.—Oct. 1872, p. 135).

HEREDITARY AFFECTIONS OF THE OPTIC NERVES.

Leber writes on cases of disease of the optic nerves in which the malady was inherited or due to congenital predisposition. No cases have been recorded in modern times excepting by Graefe and himself. He quotes the statements of the older authors in reference to "amaurosis," but of course the nature of the cases they described under that term included other lesions than those of the optic nerves. He details the histories of four families. 1. *Retro-ocular optic neuritis, central scotoma, hereditariness in a collateral line.* Five brothers were affected and two maternal uncles; a sister was not affected. 2. *Retro-ocular neuritis and neuro-retinitis in two brothers and one sister, partly acute, partly chronic—cure.* There were two other sisters and one brother unaffected. 3. *Retro-ocular neuritis in a brother and sister, resulting in a high degree of amblyopia from atrophy of the nerves.* Another brother and sister had no defect of sight. 4. *Central scotoma in consequence of retro-ocular neuritis, hereditariness in a collateral line.* No mention is made of the brothers and sisters, but it is

said that two maternal uncles suffered from the same affection. The total number of persons affected amounts to fifteen, but only nine of these were examined. If the cases mentioned by Graefe are added, we find that eighteen persons were affected in five families. A comparison of the cases examined shows that hereditary amaurosis depends on a *neuritis of the optic nerve trunk*, which commences either as a *retro-ocular neuritis*, or as a *neuro-retinitis*, and results in *partial*, or in rare cases, *total atrophy of the optic nerves*. The author then considers the symptoms which the disease produces, and more particularly *central scotoma*; *colour blindness*; the assertion of the patients that they see better *in the evening or in the shade* than in clear daylight, this applying also to cases, generally, of Graefe's retro-ocular neuritis; *subjective sensations of light and colours*; unusually marked variations in the amount of vision in two patients of the same family within a short time; the fact that both eyes were affected; the amount of vision remaining to the patients; and the applicability of the term retro-ocular neuritis to the cases. In some there was a decided affection of the optic disc and of the adjacent retina. As, however, these changes bore no relation to the gravity of the cases, and as, from other reasons, he concludes that the chief mischief was located in the trunk of the nerve, even for these cases the name retro-ocular neuritis is justifiable. At the same time the term *inflammation of the optic nerve trunk* would apply to all the cases, as it would not exclude an affection of the disc. The ophthalmoscope rarely showed a normal fundus. There frequently existed a slight haziness of the margins of the disc and hyperæmia of the vessels or even a distinct, but slight, neuro-retinitis, and often there were fine, white streaks along the vessels or patches of exudation on the disc. A figure of such a case is given. Once a considerable injection of the small retinal vessels was noticed, especially in the neighbourhood of the yellow spot. He particularly calls attention to the fact that the arteries in this stage were not smaller than natural, as is frequently the case in optic neuritis, but were either normal or even dilated. *In the later stages atrophy of the disc and moderate diminution in the size of the retinal vessels result.* The varieties of these conditions in different cases are described. *Etiology.*—In two of the families actual inheritance in a collateral line was noted. In the other two, and in Graefe's, there was only a congenital predisposition. The latter is closely connected to the former, and is evidenced by several members of the same generation being affected. Collateral inheritance is a connecting link between these two. Direct inheritance has not come under the author's notice, but instances are given amongst those cited. The parents were not related, before marriage, in any of the cases. As in two of the cases, the mother remained free whilst her brothers were affected, it would appear that men are more liable than women. In the first family

of six children, the only daughter alone remained unaffected. In the second, of three sons and three daughters, two daughters and one son escaped. In the third, of one son and three daughters, two daughters escaped. Women are not exempt. In each of the second and third families a daughter was affected, and in these instances it would appear that if women are attacked, the disease runs a more acute course or attains a higher degree of severity. In the cases quoted from older authorities (and therefore of a mixed kind), the proportion of women affected was larger. It is a question requiring further elucidation. *The age at which the patients were affected* varied in his cases from the thirteenth to the twenty-eighth year. The same variation occurred in the same family. In the family of which the history is given by Græfe, and also in the fourth of the present series, the individuals were attacked at nearly the same age (19—20). Travers notes the time of puberty, Sanson the age of 21, and Brown 16 to 17. Lucas mentions a notable instance of amaurosis attacking members of three generations at a successively earlier age in each (the grandmother at 35, the mother at 19, the children at 13 and 11). Other authors have noted cases as early as six and nine years of age, and others at later periods, the climacteric, or later still. In most of the author's cases other symptoms of slight nervous affections were present. *Result—Prognosis and Treatment.*—Notwithstanding the hereditary origin of the disease, the result is not always unfortunate. In some cases a cure practically results, only a slight amblyopia remaining. Even in the worst cases complete blindness does not result. If absolute blindness exists in the centre of the retina, a cure can only follow in recent cases. The prospect of restoration of vision in the affected parts is greater in proportion to the early stage of the disease, the slight degree of diminution of vision in the central scotoma, and the normal appearance of the optic disc. Complete pallor of the latter does not, however, exclude a restoration of vision. The prognosis seems more favourable in acute cases than in those which are slowly progressive. Moreover, there is undoubtedly a *difference in the degree of the malignancy of the affection in different families*. There is what may be termed a *genius morbi familiaris*. As regards treatment, the employment of mercurial inunctions is advocated. Græfe notes sweating as a curative means. Local blood-letting is discussed. The use of the constant current is spoken of favourably. Tonics and injections of strychnia were not found of any use. In conclusion, the author advocates the further trial of the constant current, the materials at command at present being insufficient to allow of a true estimate of its value being arrived at.—(Græfe's *Archiv. f. Ophth.*, xvii, B. Abt., ii, pp. 249—291.)

DERMIC GRAFTING IN OPHTHALMIC SURGERY.

Dr. Wecker describes the plans of epidermic grafting advocated by M. Reverdin and by M. Ollier, and then passes on to one of his own which he calls dermic grafting. He pinches up a small fold of the skin of the arm, or of the fore-arm, between his thumb and index finger, and transfixes the base of it with a small bistoury. The piece of skin is seized with forceps and cut off at the base with a pair of curved scissors. He thus obtains small grafts which, when retracted, measure from 6 to 8 mm. ($\cdot 24''$ — $\cdot 32''$) in different directions. These grafts are then applied to the wound and spread out carefully by means of a blunt probe. It is intended that the wound should be covered as completely as possible with a serrated mosaic of these pieces. The wounds of the lids or in their neighbourhood measure commonly only about 3—4 cent. ($1\cdot 2''$ — $1\cdot 6''$), and require about 10 or 20 pieces to cover them. A piece of gummed goldbeater's skin is then placed over the wound, and this allows of a constant inspection of the condition of the grafts. A bandage is applied over the eyes to insure absolute immobility. The dressing is not changed for twenty-four hours. The change which occurs in the colour of the grafts indicates in a few days whether the result will be successful or not. Those pieces which adhere have a rosy colour at the end of 36 or 48 hours, gradually becoming red; whilst those which have not taken keep their palish yellow tint, become encircled with a brownish black ring, and finally mummify. It is remarkable that even beneath the mummified grafts when they become detached, it is found that cicatrization has been completely established. In reality it is then discovered that only the epidermis has shrivelled up, and that the derma has become grafted. If any fail, however, it is an easy matter to fill up the gaps left in the mosaic. By this means suppuration is prevented, which is injurious to the other grafts. He does not hesitate to assert that covering a wound in a state of granulation "at the edges of which cicatrization is commencing, or, at least, is about to commence" (Reverdin), with this kind of mosaic will at once check suppuration. The indications for the employment of grafting appear, at present, to be the following. 1. Grafting ought always to be employed in cases of burn of the eyelids or neighbouring parts which give rise to suppurating wounds, and by faulty cicatrization, of which deformity or displacement of the eyelids would be caused. 2. It can be very advantageously employed in cases of partial or complete ectropion of the eyelids in consequence of cicatricial contraction in their neighbourhood (burns, caries, fractures, &c.). 3. Dermic grafting may, with advantage, take the place of almost all, if not all, blepharoplastic operations. 4. Grafting ought to be employed in all cases in which the eyelids have undergone a considerable loss of substance in consequence

of an accident or after operation, and a suppurating wound remains.—(*Annales d'Oculistique*, July—August, 1872, p. 62.)

THE OCULAR TREPHINE AND ITS APPLICATION.

Dr. Wecker describes a trephine which differs from the one shown at the London Congress by Mr. Bowman. He gives the following indications for its employment:—(*a.*) In cases of total cicatrization of the cornea, especially when the lens has escaped, Dr. Wecker has removed a portion of cornea with the view of establishing a permanent fistula, and with a good result. (*b.*) In cases of absolute glaucoma, when the atrophy of the iris is so advanced that iridectomy cannot be practised, and simple sclerotomy is not sufficient, Dr. Wecker removes a circular portion of the cornea $1\frac{1}{2}$ mm. ($\cdot 06''$) in diameter at the corneal margin, so as neither to wound the lens nor to approach too near to the ciliary region. He does this to relieve pain and avoid enucleation.—(*Annales d'Oculistique*, Sept.—Oct., 1872, p. 137.)

OBSTINATE EXCESSIVE LACHRYMATION TREATED BY EXTIRPATION OF THE LACHRYMAL GLAND.

Dr. Talko records the case of a man, æt. 22, who had all his lifetime suffered from an overflow of tears on the left side. The duct was pervious. The lachrymal gland was excised. The man recovered and resumed his occupation. He could not himself appreciate any difference as regards the moisture of the two eyes. When examined, the eye which was operated on seemed rather the moister of the two. That the eye would not become dry was asserted for two reasons, first, because the palpebral portion of the gland was not removed; and, secondly, because it has been shewn that after the extirpation of both portions of the lachrymal gland no xerophthalmia results, the eye being moistened by the secretion of the Meibomian glands, &c. In the present case excitation of the remaining portion of gland by means of collodion, &c., caused a perceptible overflow of tears.—(*Zehend. Klin. Monat.*, x, p. 17.)

A NEW METHOD OF ENUCLEATING THE EYEBALL.

Tillaux (*Bull. de Thérap.*, 15 Juill., 1872, p. 24) describes the following plan:—The eyelids being held apart, the conjunctiva is seized with forceps at the outer part of the globe, and divided close to the cornea; then the tendon of the external rectus is cut at the surface of the sclerotic. Traction being made inwards with the forceps in the same position as before, the scissors are at once carried backwards, and the optic nerve easily found and divided close to its entrance into the globe. Finally, the posterior

half of the globe is seized with forceps and drawn out from behind forwards, bringing it in front of the conjunctival wound. The other muscles are thus rendered tense, and are easily divided.—(*Annales d'Oculistique*, Sept.—Oct., 1872, p. 182.)

ACCIDENTAL IRIDEREMIA, OR COMPLETE REMOVAL OF THE IRIS, BY
THE FINGER NAIL OF AN ANTAGONIST.

Dr. Chisholm notes the case of a man, æt. 37, who presented himself for treatment on account of chronic inflammation of the left cornea. It was at once remarked that his two eyes presented a striking contrast. The left eye, for which he desired treatment, was of a bright blue colour, whilst the entire corneal portion of the right eye was black in colour, with the exception of a white triangular scar, $1\frac{1}{2}$ lines wide at its base, which rested upon the lower edge of the cornea, with the apex extending vertically a little beyond the pupillary margin. There was no iritic ring bordering the enlarged pupil. The eye looked, at first sight, as if it were quite blind from some old injury. A normal state of the fundus was found, however, on examining with the ophthalmoscope, and on questioning the man it appeared that this was his better eye. Three years before, he was engaged in a fight, during which his antagonist had gouged him in the right eye; he suffered no pain during the excitement of the row, and was not aware till the next day that his eye was injured. He then discovered the change in the colour of the eye, and detected a shred of membrane protruding from a scratch in the front of the eyeball. After one or two days this fragment, which was hanging out, came away, leaving a white scar over the sight. On the most careful examination, no trace of iris could be discovered. "When the thrust of the finger had driven the nail through the cornea, it had in some inexplicable manner entered the pupillary opening, and passing between the capsule of the lens and the iris, had thrust this latter membrane against the inner face of the cornea. Acting then as a hook, the finger nail had drawn the iris out of the corneal wound, detaching it from the ciliary ligament, the edge of the adhesion being weaker than the cohesion of the iris substance. The final escape of the protruding iris had been effected by the continued drawing action of the ever-winking eyelids. The finger nail had in no way injured the lens or the accommodation of the eye." The absence of the iris enabled rays to pass by the side of the corneal cicatrix. The eye was myopic; whether it had always been so was not certain. V. 1 J. at 4" and 20 at 8'.—(*Am. Journ. Med. Sci.*, July, 1872, p. 125.)

SEVERE OPHTHALMIA CAUSED BY EXPOSURE TO THE INTENSE LIGHT REFLECTED FROM THE DAZZLING SURFACE OF SNOW.

Dr. Gardner records cases in which ophthalmia, varying from a slight ephemeral character to a violent panophthalmitis, followed as the result of exposure to the intense light reflected from the surface of snow. The ophthalmia may destroy the eye at once, or leaves a condition which may do so secondarily. The author offers the following explanation of the way in which the eyes become affected. Under all conditions, except when the sun is very near the horizon, the eye is protected from its *direct* rays by the supra-orbital arch and eyebrow, but the snow on the ground, acting as a mirror, throws the *reflected* rays directly into the eye, and the cause acts with more constancy and severity to a pedestrian than to a person riding on horseback or in a covered sleigh, for the body of the sleigh intercepts the reflected light to a great extent, and the head and neck of the horse do the same to a certain extent. Usually, however, the severity of the cold or the condition of the roads makes walking the only means of travel where this disease most frequently prevails. Many travelers over snowy regions blacken the parts about the orbit with gunpowder dissolved in water. The Esquimaux use an opaque shield of wood or skin, which has a horizontal slit over the pupil to admit the light. Some of the Indians use an apparatus formed of two tubes of stiff buffalo hide, about two inches long and three-quarters of an inch in diameter, sewed firmly to a head-band of tanned hide, with openings for the tubes. These plans are equivalent to adding a diaphragm external to the iris. The pupil of course contracts on exposure to the strong light, but even the *smallest* opening so near the retina as is the pupil yet allows of so great illumination as to become a cause of disease. Dr. Gardner has devised goggles of hard rubber, shaped to fit over the orbit, and having over the pupil, in the axis of vision, a stenopaic opening, or a small oval opening whose long axis is placed transversely. He has found these quite efficient in preventing ophthalmia. Coloured glasses greatly annoy those who are not used to them by the discoloration of surrounding objects which they produce.—(Am. Journ. Med. Sci., April, 1871, p. 334.)

SARCOMA OF THE LOWER EYELID.

A boy, six years of age, was sent to Dr. Hirschberg for a large tumour of the lower eyelid. This was removed by an operation of which the details are fully given. The structure was that of a small-celled sarcoma. Figures of the appearance of the boy's face are given.—(Archives of Ophth. and Otol., vol. ii, No. 2, p. 14.)

A TEARSTONE IN THE CANALICULUS INFERIOR.

Dr. Pagenstecher records a case. The patient was a man aged 70. He had suffered from epiphora for long. There was a small tumour the size of a split pea. A grating sensation was felt in passing the point of a syringe down to it. An incision, &c., let out the concretion. A figure of the tearstone is given.—(*Archives of Ophth. and Otol.*, vol. ii, No. 2, p. 219.)

TATTOOING OF THE CORNEA.

Dr. Wecker contributes a paper on this subject. He thinks that tattooing may be useful in certain cases instead of a stenopaëic glass. He tattoos on six or eight different occasions so as to get a thoroughly black colour.—(*Archives of Ophth. and Otol.*, vol. ii, No. 2, p. 224.)

JELLY-LIKE EXUDATION IN THE ANTERIOR CHAMBER.

Dr. Gunning records three cases in which he met with a jelly-like exudation in the anterior chamber. In one case it presented the appearance shown by a lens when dislocated into the anterior chamber. In two of the cases the origin was traced to syphilis, in the third to rheumatism. Prof. Schmidt has recorded two similar cases in the number for April—May, 1871, p. 94.—(*Zehend. Klin. Monat.*, x, p. 7.)

DOUBLE, ISOLATED RUPTURE OF THE CHOROID.

Dr. Hersing records a case. The patient was a young man, and was under observation two years. One rupture passed through the yellow-spot region. The sight became almost wholly restored. The narrator is only aware of two other cases having been recorded. The patient saw straight lines as if curved in a particular way. An illustration of this is given.—(*Zehend. Klin. Monat.*, x, p. 11.)

FISTULE OF THE LACHRYMAL CANALS.

Dr. Talko notes the case of a young soldier who had four openings into the lachrymal canals of one eye; two of them corresponded to the ordinary puncta, and the other two were fistulæ. They were clearly not of congenital origin, but had existed from childhood.—(*Zehend. Klin. Monat.*, x, p. 23.)

ENTROPION SPASTICUM OPERATED ON BY A NEW METHOD, THAT OF
PROF. SZOKALSKI.

Talko, *Zehend. Klin. Monat.* x, p. 25. This operation consists in cutting a rectangular flap, one side of which corresponds

to the border of the lid. From this flap, after dissecting it up as much as may be necessary (2—3'''), is snipped off, and the remainder stitched to the distal horizontal border of the wound.

AMOUNT OF ACCOMMODATION IN APHAKIA.

Prof. Förster, who writes on this subject, quotes cases recorded and tabulates them.—(Zehend. Klin. Monat., x, p. 39.)

PARALYSIS OF THE OCULOMOTORIUS IN ACUTE ARTICULAR RHEUMATISM.

Dr. Michel (Zehend. Klin. Monat., x, p. 167).

TRAUMATIC PARALYSIS OF ACCOMMODATION.

A young man was struck in the eye by a piece of iron chipped off from a tool he was working with. He came under the care of Dr. Harlan a few hours later. There was no pain and no external appearance of injury. No application had been made to the eye. The pupil was widely dilated. $V = \frac{2}{7} \frac{0}{0}$ Sn. (injured eye) $\frac{2}{2} \frac{0}{0}$ (sound eye). Small type could not be distinguished. He was hypermetropic $\frac{1}{48}$, and with + 48 glass he read $\frac{2}{2} \frac{0}{0}$. Near vision was equally good with appropriate glass. The application of calabar bean contracted the pupil, and he could then read small print, but at a distance of eight inches only, and he required a concave glass to make vision perfect. The patient was not seen again.—(Am. Journ. Med. Sci., Jan. 1871, p. 139.)

CASES OF INJURY TO THE EYE.

Dr. Harlan records the following cases:—

CASE 1.—*Blow on the eye—Rupture of sclero-corneal region—Escape of the lens and of the iris—Good vision with lenses.*—A lad æt. 15 was struck on the closed upper eyelid of the right eye with a tin horn thrown by a playmate. When seen, at the end of seven months, there was a slight cicatrix on the lid just above its ciliary margin, and there was an indistinct scar exactly at the sclero-corneal junction, occupying its lower and inner third. Not a vestige of the iris remained. Ophthalmoscopic examination showed a slight separation of the retina at the ora serrata at a point corresponding with the cicatrix in the eyeball. The lens was found to be absent. The vision unaided amounted only to quantitative perception of light, but with $3\frac{1}{2}$ convex glass $V = \frac{2}{3} \frac{0}{0}$, and with + $2\frac{3}{4}$ the lad could read the smallest print. The rupture must have been by contre-coup. The external cicatrix was so indistinct that it escaped notice till the state of the ora serrata directed special attention to the part.

CASE 2.—*Escape of greater part of the iris through a wound of the cornea, without injury to the lens.*

CASE 3.—*Dislocation of the lens with myopia.*—Vision was improved by the absence of the lens.

CASE 4.—*Injury to the eye from molten lead.*—The eye was lost.

CASE 5.—*Injury from molten solder.*—The eyelids were glued together, but the eye was found uninjured.

CASE 6.—*Injury to one eye—Sympathetic ophthalmia of the other after four years—Foreign body in the orbit.*—The patient was a boy aged 19. The blind eye was extirpated, and a piece of iron found imbedded in the orbital tissue. It was an eighth of an inch wide, and more than an inch long, and must have passed through the eye to reach its position behind it, and at the inner side of the internal rectus muscle. The surface was rough, and it was held so closely by the surrounding tissue, that it was found impossible to remove it till it was dissected out, almost like a piece of bone from its periosteum. The operation was followed by complete relief.

FOREIGN BODY IMPACTED FOR FIVE YEARS UNDER THE UPPER EYELID.

The patient was a man aged 42. He came to Dr. Monoyer for irritation of the right eye. On everting the upper eyelid a large foreign body dropped out. It was a "*crab's eye*." He then recollected that he had been advised, five years before, to put a so-called "*crab's eye*,"* into his eye to drive away a small foreign body which was there. After he had put this in, he forgot all about it, and then in the morning imagined it had escaped during the night. His eye had been irritable at various times, but the irritation generally subsided when he rubbed the eyelid gently. If he rubbed too hard, a little pus would escape from the inner angle of the eye the day afterwards.—(*Annales d'Oculistique*, Nov.—Dec. 1872, p. 275, from *Gaz. Med. de Strasb.*, 1872, Dec., p. 97.)

LARGE FOREIGN BODY IN THE ORBIT—EXTRACTION AT THE END OF TEN DAYS—SIGHT UNAFFECTED.

Dr. Borel notes the case of a woman aged 30, who had received a violent blow on the eye from her husband's pipe. The mouth-piece struck the eye. The husband threw the pipe away directly and it was not seen again. At the end of ten days an examination was made, and Dr. Borel withdrew the *amber mouth-piece* of the pipe, intact, from the orbit. It was about half-an-inch in breadth, and an inch and a-half in length.—(*Annales d'Oculistique*, Mai—Juin, 1872, p. 245.)

* *Cancrorum oculi*, &c., Mayne.

EXTRACTION OF THE LENS IN ITS CAPSULE.

Terson (Revue Méd. de Toulouse, 1872, Nos. 3 and 4) advocates the removal of the lens in its capsule in certain cases. In 72 operations performed on Græfe's plan, he removed the lens and its capsule seven times. In two of these cases he removed the lens in its capsule intact. It is not always necessary to have recourse to forceps, &c. The ordinary pressure movements may be tried without lacerating the capsule. If the lens is hard throughout, it and its capsule may be seized with forceps. If the nucleus is surrounded by soft cortical matter, the forceps must be passed deeply. If the capsule gives way, the extraction must be completed in the ordinary way. The employment of a curette is dangerous as regards the vitreous.—(Annales d'Oculistique, Mai—Juin, 1872, p. 313.)

PASSIVE BLEPHAROSPASM INSTANTANEOUSLY CURED BY A VERY SIMPLE AND CURIOUS MEANS.

Dr. Monoyer relates the case of a girl aged six or seven years, who came home one day unable to open the left eye. The eyelids were closely shut together. At the end of three days, when she awoke from sleep, she opened both eyes. Three days later she again came home unable to open the left eye, and this condition then remained for another fortnight, when Dr. Monoyer saw her with the left eyelids closely shut and gently pressed together. He opened them with his fingers, and told the child to keep the eye open. She could not do so. He then *shut the other eye*, and opened the left, and told her to look straight at him. He then released the left eyelids, and they remained opened, and also when he allowed the right eyelids to open the left one remained opened. From that time the eyelids could be opened and shut by the child with ease.—(Annales d'Oculistique, Nov.—Dec., 1872, p. 267, from Gaz. Méd. de Strasb. 1872, Dec.)

BLEPHAROPLASTIC OPERATIONS.

H. Knapp, German Ophth. Congress (Report Archives of Ophth. and Otol., vol. ii, No. 2, p. 209).

A CASE OF MALFORMATION—THE EYES COVERED OVER WITH SKIN—KRYPTOPHTHALMOS.

Dr. Zehender describes and figures a case of malformation in which the eyes were concealed by a growth of skin over them. The child lived six months. It was probable there was perception of light. He is not aware of a similar malformation having been recorded, in which both eyeballs were present though pathologically changed, yet still comparatively perfect, and in which the

outer cutaneous covering was continued over the eyes. The post mortem examination is described by Professor Ackermann, and a detailed description of the eyeballs, &c., is given by Professor Manz. The eyelids and palpebral fissures were wholly wanting. Various interesting anomalies were found in the eyeballs.—(Zehender Klin. Monat., x, pp. 225—249.)

COLOBOMA OCULI.

Dr. Reich records a unique case of coloboma in the neighbourhood of the yellow spot, without coloboma iridis, or of any other part of the choroid or of the retina. He remarks on the whole subject of coloboma oculi.—(Zehend. Klin. Monat., x, p. 56.)

ON OSSIFICATION OF THE HUMAN CRYSTALLINE LENS.

Dr. Berthold narrates a case in which there appeared reason to think that the lens was ossified. Careful microscopic examination (given in detail) showed it was not so. He sums up that the choroid is the most frequent place of origin for ossification within the eye; that the iris may ossify, and the product be confounded with an ossified lens; that the ciliary body shows the least tendency to ossify; and that ossification of the human lens has not hitherto been proved.—(Græfe's Archiv. f. Ophth. 18 B. Abth. 1, p. 104.) (See also Knapp, preceding Periscope.)

SUDDEN OBLITERATION OF THE CENTRAL ARTERY OF THE RETINA.

A. Sichel (Arch. de Physiol. Paris, t. iv, 1872) gives an interesting example of embolism diagnosed during life and verified by the post mortem. The original is accompanied by a good chromolithographic plate.—(Annales d'Oculistique, Mai—Juin, 1872, p. 314.)

HYDATIDS IN THE FRONTAL SINUS, AND IN THE ORBIT—INCISION—EVACUATION OF THE HYDATIC CYSTS—CURE.

Verdalle records an interesting and obscure case.—(Bordeaux Médical, 8 Sept. 1872; Annales d'Oculistique, Sept.—Oct., 1872, p. 185.)

CYSTICERCUS CELLULOSE IN THE VITREOUS EXTRACTED WITHOUT IMPAIRMENT OF SIGHT RESULTING.

A case under the care of Dr. Hirschberg is noted in the Annales d'Oculistique (Sept.—Oct., 1872, p. 141).

CYSTICERCUS INTRA-OCULARIS.

Dr. Hirschberg records a case. The eyeball was excised. A figure is given.—(Archives of Ophth. and Otol., vol. ii, No. 2, p. 11.)

A CASE OF CYSTICERCUS WITHIN THE EYE.

A. Sichel records (*Gaz. Hebdomadaire*, 11th January, 1872, No. 2) a case in which he removed a cysticercus from the vitreous through a sclerotic incision. The pain, which had previously been horrible, ceased. The eye atrophied.—(*Annales d'Oculistique*, Mai—Juin, 1872, p. 314.) First case noted in France.

GLIOMA RETINÆ.

Dr. Hirschberg supplies three contributions, with narratives of cases, on the histology of glioma retinæ, which are contained in the *Archives of Ophthalmology and Otolaryngology*, vol. ii, No. 2, pp. 18, 21, 29, with illustrations.

INTRA-OCULAR TUMOURS.

Dr. H. Z. Gill narrates cases of intra-ocular tumours, and gives illustrations of the macro- and microscopic appearances. He appends a tabular statement, which we have modified.

No.	Variety.	Age. Duration.	Result after Operation.
1....	Melano-sarcoma .	{ 60 years. Few weeks.	{ No return in the orbit, but the patient died, one year and a few days later, "with all the symptoms of cancer of the liver."
2....	Glioma	{ 2½ years. Not stated.	{ Died in 4 months.
3....	White sarcoma ..	{ 19 years. Some time.	{ No return in 16 months.
4....	Melano sarcoma .	{ 35 years. 15 months.	{ Death in 8 months.
5....	Glioma	{ 2½ years. Not stated.	{ Died in 4 months.
6....	Glioma	{ 2½ years. Not stated.	{ Died 7 months later.
7....	Glioma	{ 5 yrs. 10 mo. One year.	{ Died in 1 month.

DR. DELAFIELD.

No.	Variety.	Age. Duration.	Result after Operation.
1....	Glioma	{ 18 months. 3 months. }	No return for 2 months.
2....	"	{ 4 years. 2 years. }	Died within a year.
3....	"	{ 4 years. 8 months. }	Died within a year.
4....	"	{ 2 years. 1 year. }	Died within 3 months.
5....	"	{ 2½ years. 6 months. }	Died in 3 months.

PROFESSOR KNAPP.

1....	Glioma	18 weeks.	Died in 2 years.
2....	"	4 years.	Died in 4 weeks.
3....	"	2½ years.	Died in 3 months.
4....	"	2 years.	Died in 2½ months.
5....	"	2½ years.	Died in 3½ months.
6....	"	2½ years.	Probably died.

Dr. Gill remarks that the prognosis in glioma retinae is almost entirely dependent on the extent of the disease, as marked by the sclerotic capsule. If the disease has extended so as to involve the orbital contents to any considerable extent, operative procedures are but palliative. The statistics given show a most discouraging mortality, if no better results can be obtained. In all Dr. Gill's cases the disease was far advanced before the operation. The seat of origin of glioma may be in any layer of the retina, anterior or posterior. The manner of origin is obscure. The place of origin is most commonly the inner granular layer.—(Pamphlet reprinted from the St. Louis Med. and Surg. Journ.)

RETINAL TUMOURS WITH SHORT PEDICLES.

Dr. Pagenstecher, Germ. Oph. Congress. (Report by Dr. Knapp, Archives of Ophth. and Otol., vol. ii, No. 2, p. 214.)

FIBROMA OF THE SCLEROTIC.

Prof. Saemisch, of Bonn, records a case. The patient was a girl, ten years of age. Symptoms had been noticed for a year. The symptoms, when she came under care, appeared to be those of an intra-ocular tumour which had perforated backwards. There was a yellowish-gray reflex to be made out through the pupil, which was widely dilated. The tension was increased, and the eyeball projected somewhat. Enucleation revealed that the posterior half of the bulb inwards from the optic nerve was the seat of a dense tumour mass. The section of the nerve was normal. On section of the eyeball, a few drops of a thick yellow material, resembling thick pus, and consisting of round nuclei, escaped. The lens was pressed forward, and the whole retina detached. The vitreous chamber was obliterated. In the region of the optic disc, and further outward, the choroid was united with the retina in a broad solid mass, 2 mm. (.08") in thickness. The subretinal space was filled with a pulpy, compact mass of a yellow colour. No vessels could be found. From the optic entrance, inward, a tumour, 10 mm. (.4") long, 8 mm. (.32") wide, and 5 mm. (.20") thick, was located upon the outer surface of the sclera, extending to the optic nerve, and so intimately attached to the, elsewhere, unchanged sclera, whose inner surface at the affected place was entirely normal, that the outer surface could not be distinguished from the substance of the tumour. The results of the microscopic examination are given in detail. Changes were found in the retina and choroid. The tumour consisted of a fibrous connective tissue which in torn preparations appeared extremely wavy and interspersed with here more, there fewer, cellular elements, which exhibited the development of fibre from round cells in all phases; so that here was a connective-tissue neoplasm in luxuriant growth. "The anatomical diagnosis was accordingly extra-ocular fibroma of the sclera and a circumscribed intra-ocular fibroid degeneration of the choroid and retina." In reference to the question of reconciling the clinical diagnosis, before removal, with the anatomical condition discovered afterwards, Dr. Saemisch says: "The diagnosis of glioma rested on the following morbid phenomena:—1. Increased hardness of the globe, together with other data evincing increased intra-ocular tension, as congestion of the anterior ciliary veins, flattening of the anterior chamber, dilatation of the pupil, &c. 2. Abolition of function, with the peculiar yellowish reflex from the two masses behind the lens, which must be considered as solid. 3. The age of the patient. 4. That the visual disturbance had been observed a year previously, but had gradually increased to total blindness lately, and coincidently with severe pain and protrusion of the eye. This circumstance justified the supposition that the glioma had increased rapidly

within a short time, and become extra-bulbular." "No one would suppose that the two elevations were produced by a total detachment of the retina and such a quantity of thick pus in the sub-retinal space as to give them a yellow tint, because, in this case, the changes which usually accompany the collection of so much pus in the interior of the globe were absent, viz., swelling of the lids, chemosis, discoloration of the iris, turbidity of the aqueous, and, perhaps, also, hypopyon." "If the tumour were primarily extra-bulbular, with limitation of visual power later and in consequence of pressure upon the optic nerve, we should have expected the appearance of diplopia amongst the functional lesions." "The visual disturbance, in consequence of the growth of a tumour near the optic nerve, was perhaps considerable from the first, without the patient having sufficiently distinguished the diplopia. This I believe to be the probability." "As far as I know, this is a unique case of fibroma of the sclera developing upon the posterior section of that membrane, and at the same time it furnishes evidence that the subject of ocular tumours, to which so much attention has been given of late, is not yet fully elucidated."—(Archives of Ophth. and Otol., vol. ii, No. 2, p. 304.)

CYSTS OF THE IRIS—A CASE OF PENETRATING WOUND OF THE CORNEA WITH EYELASHES IN THE ANTERIOR CHAMBER, AND SUBSEQUENT FORMATION OF A CYST IN THE IRIS.

The cyst was of the nature of a pearly cholesteatoma. Dr. Rothmund quotes all the cases of cysts of the iris he can find recorded, 37 in number. In 28 there was a history of injury. Total excision of the cyst is the proper treatment. In seven out of twenty-two of such operations a bad result followed. The sight is generally much impaired or lost. The greater number of the cysts were serous; some were gelatinous, and some epidermoid. The cysts originate for the most part in consequence of wounds. The epidermal cysts certainly arise from injury, and, indeed, from implantation of cutis or of cells of the hair follicles. The other kinds possibly originate from detached, implanted, epithelial cells from the conjunctival covering of the cornea, or, as Wecker states, from the gradual encysting of a portion of the iris in consequence of the wound, and, in that case, the cyst contents consist only of aqueous humour.—(Zehend. Klin. Monat., x, pp. 189—223, with illustrations.)

PEARLY OR CHOLESTEATOMATOUS EPITHELIOMA OF THE IRIS.

Dr. Monoyer records (Gazette Med. de Strasbourg, 1872, 1st Juin) a case of double, pearly epithelioma of the iris following on a wound of the eye, in which extraction of the larger tumour

was practised. Panophthalmitis followed. The case is given in detail, and an account of the microscopic examination is added. He criticises Dr. Rothmund's views. Lastly, he recommends that when a solid tumour, having its seat in the anterior chamber, has to be removed, the old flap incision should be adopted in preference to a linear incision, inasmuch as the first alone gives the operator facility for enlarging the corneal wound to the necessary extent.—(*Annales d'Oculistique*, Mai—Juin, 1872, p. 249.)

HERPES ZOSTER CORNEÆ.

Prof. Horner remarked that this term has never been correctly defined, and is by no means identical with the phlyctenular keratitis, which is described by Stellwag under the name of "herpes corneæ." The "herpes zoster corneæ" begins with collections of clear vesicles, arranged in the form of a wreath upon the cornea. After these rupture there appears an irregular loss of substance beneath, as if it were the result of a scratch. The cornea soon becomes opaque, and is usually insensible throughout its whole extent. The course is slow, and the regeneration of the epithelium especially is very gradual. The tension of the globe is never markedly lessened. The retina is the seat of venous hyperæmia. There is another form of the affection very similar to the one just described, but in which the tension of the globe and the sensibility of the cornea are not especially altered. Horner observed 31 cases of herpes corneæ in the course of the year, and in many there was present, at the same time, herpes of the lips and cheeks. In most of the cases the affection of the eye was preceded by some general constitutional disorder, as pneumonia, intermittent fever, or the like. The average age of the patients was 35 years. A few cases were cured in two weeks, but the most lasted one and a half to two months. The disease is, with rare exceptions, monocular, and manifests no tendency to complications with iritis, nor to recurrence. Nagel saw the same complication of symptoms in a case where there was but a single vesicle. The case healed rapidly under the application of the constant current after other means had failed. Horner had also seen cases where the vesicles appeared in the centre of the cornea, and were few in number. Hypodermic injections of morphia are to be recommended for the purpose of allaying the pain, and the opening of the vesicles somewhat lessens the pain also. Von Græfe, from a verbal communication, was accustomed in this affection to dust calomel into the eye. Warm poultices act unfavourably, but a protecting bandage and instillation of atropine are, on the contrary, to be recommended.—(*Knapp's Report of German Ophth. Cong., Archives of Ophth. and Otol.*, vol. ii, No. 2, p. 197.)

GENUINE HERPES OF THE CORNEA.

Dr. Schmidt records two cases. There was no complication with any internal malady, such as that to which Horner has called attention.—(*Zehend. Klin. Monat.*, x, p. 163.)

DIVERGENT STRABISMUS.

Dr. Loring, jr., writes on divergent strabismus, and more especially with reference to its treatment by operation. He thinks that the plan of bringing forward the internal rectus, though for a time fallen into discredit, is the one from which most advantage results. It is generally stated that myopia is the most frequent cause of divergent strabismus, and if we take this in its broadest sense as applying to absolute, relative, and dynamic squint, this statement is undoubtedly correct. Nevertheless it is comparatively rare in simple myopia, even of the highest grades, that we see that degree of divergence which produces the greatest deformity. It is in hypermetropia that we meet with the greatest amount of divergence, in cases in which an operation for convergent strabismus has been performed. In simple myopia the strabismus is rather relative than absolute. This no doubt depends on the fact that as the eyeball increases in length the power of both internal and external recti is diminished, so that though, in such eyes, a certain amount of insufficiency, or even relative divergent strabismus, for even moderately near objects is produced, we generally have, at the same time, a certain amount of insufficiency of the external recti for distance, or, at any rate, we seldom get that amount of absolute divergence mentioned above, for the simple reason that the externi have not the power to produce it. Dr. Loring thinks that unequal refraction of the two eyes is a powerful cause of divergent strabismus. Take, for example, emmetropia in one eye and hypermetropia in the other. The amount of effort required to produce convergence of the emmetropic eye must be greater than that for the shorter (hypermetropic) eye. This effort being made, the hypermetropic eye will be influenced to the same extent, more than is necessary, and will converge too strongly. If, now, an operation be performed, and both internal recti be divided, the emmetropic eye, as far as its muscles are concerned, is in the condition of a myopic one, a certain amount of insufficiency is produced, and when the eyes are directed on a near object, if one be covered it will make spasmodic efforts at convergence followed by an associated movement outwards. Thus we have a dynamic squint produced, which soon increases, and causes a bad kind of asthenopia. It is in these cases that advancement of the internal rectus is most indicated. Various methods have of late been advocated, chiefly by Græfe, Critchett, Agnew, and

Liebreich. Loring describes the different methods, and mentions the cases in which each seems most available. He points out that when the tendon of the internal rectus is stitched forwards by sutures placed in the vertical meridian above and below the cornea, not in the transverse line of the middle of the cornea, there is great liability of rotating the eye by dragging too much on the upper or lower suture. This causes very distressing vertical diplopia without the eye is very amblyopic. Dr. Knapp only operates on one eye. Dr. Loring would agree with those who divide both external recti; the effect is divided, the excessive shortening of the internal rectus is avoided, and the movements of the eyeball are not so much diminished. A diagram illustrates these points. The squinting eye, having an absolute divergence, can never fix an object without the other eye makes a corresponding, associated movement outwards. Even when the patient is under the influence of chloroform, after the internal rectus has been brought forward, the other eye will be found to have made an associated movement outwards. Dr. Loring describes Knapp's and Græfe's operations for slighter degrees in which it is not necessary to advance the internal rectus. We should be cautious as to bringing forward the internal recti in cases in which advancement of the myopia is threatened, for, by increasing the tension of these muscles, we may again set up mischief which had become quiescent. Among the inconveniences of the operation may be noted a disturbance of accommodation. Dr. Loring has seen a case in which artificial myopia or spasm of the ciliary muscle was produced, the eye previous to operation being emmetropic, and afterwards myopic, $\frac{1}{2}$. This yielded to atropine, but recurred when the atropine was left off.—(Am. Journ. Med. Sci., April, 1871, p. 325.)

REFERENCES.

Notes on Ophthalmological and Otological Subjects made during a Journey through Europe. By H. Knapp (Archives of Ophth. and Otol., vol. ii, No. 2, p. 153).—These notes are very interesting and embrace a variety of subjects.

The Galvanic Treatment of Diseases of the Eye and Ear. By Prof. Erb, of Heidelberg (Archives of Ophth. and Otol., vol. ii, No. 2, pp. 228—300).

Report on the Transactions of the German Ophthalmological Congress held at Heidelberg, 1871.—An interesting report by Dr. Knapp will be found, in English, in the Archives of Ophth. and Otol., vol. ii, No. 2, pp. 194—218.

Refutation of the latest Attacks on Græfe's Linear Extraction.—Dr. Julius Jacobson refutes various statements made by

different writers in regard to the failures of Græfe's operation. He especially refers to Liebreich and his new operation.—(Græfe's Archiv. für Ophth., 18 B., Abth. 1, p. 29.)

The Influence of Lenses on the Acuteness of Vision.—Dr. Woinow writes a paper on this subject.—(Græfe's Archiv. für Ophth., 18 B., Abth. 1, p. 349.)

The Nerves of the Conjunctiva.—Dr. Helfrich criticises Dr. Morano's communication, in a former number, on the nerves of the cornea.—(Græfe's Archiv. für Ophth. 18 B., Abth. 1, p. 356.)

Edema of the Conjunctiva and its significance after Operations.—Prof. Schiess (Zehend. Klin. Monat. x, p. 1).

Rotation of the Eyes during Convergence and Accommodation.—A communication from Dr. Dobrowolsky on this subject will be found in Græfe's Archiv. für Ophth., 18 B., Abth. 1, p. 53.

(1.) *The Sensitiveness of the Eye for Different Colours of the Spectrum*; (2.) *The Sensitiveness of the Eye for Intensity of Illumination of various Colours of the Spectrum*; (3.) *On Proportionate Diminution and Addition of Intensity of Illumination of different Colours of the Spectrum, with Proportionate Diminution and Addition of the Intensity of the General Illumination*; (4.) *On the Sensitiveness of the Eye for Tints of Colour.*—Communications on the above subjects from the pen of Dr. Dobrowolsky will be found in Græfe's Archiv. für Ophth., 18 B., Abth. 1, pp. 66—103.

A Case of Coloboma of the Eyelids.—Dr. Pflüger (Zehend. Klin. Monat., x, p. 250).

Excision of the Eyeball followed by a Fatal Result.—Dr. Just (Zehend. Klin. Monat., x, p. 253). No post-mortem.

The use of the Metrical System in the numbering of Spectacle Glasses and the choice of a Unity of Refraction.—Dr. Monoyer criticises a communication made by M. Javal to the Ophth. Congress in London.—(Annales d'Oculistique, Sept.—Oct., 1872, p. 105.)

The History of Ophthalmic Surgery among the Ancients.—Prof. Anagnostakis continues his series of communications.—(Annales d'Oculistique, Sept.—Oct., 1872, p. 117.)

Note on Insufficiency of the Oblique Muscles.—Dr. Savary records a case of an unusual form of strabismus, with a diagram.—(Annales d'Oculistique, Sept.—Oct., 1872, p. 129.)

Affection of the Eyes in Leprosy.—Fourteen cases are recorded by Dr. Pedraglia (Zehend. Klin. Monat., x, p. 65).

Myopia.—Two cases of acute myopia of an unusual character. Dr. Schroeter, Zehend. Klin. Monat., x, p. 84.

The situation and size of the Erect Image of the Fundus of the Eye.—Dr. Schnabel (Zehend. Klin. Monat., x, pp. 117—148).

A new Apparatus for Testing the Field of Vision.—Dr. Scherk (Zehend. Klin. Monat., x, p. 151, with an illustration). A hollow hemisphere, the inside of which is mapped out into divisions, which are numbered.

The size of the Field of Vision with different degrees of Refraction.—Dr. W. Dobrowolsky (Zehend. Klin. Monat., x, p. 159).

A new method of estimating the Ocular Optic Constants.—Drs. Mandelstamm and Schöler write on this subject, and describe and figure a new instrument. The paper deals with (1) *The estimation of the distance of the plane of the pupil from the apex of the cornea*; and (2) *The estimation of the radius of the curvature of the anterior surface of the lens.*—(Græfe's Archiv. für Ophth., 18 B., Abth. 1, p. 155.)

VISIBLE PULSATION OF THE ARTERIA CENTRALIS RETINÆ IN A CASE OF INCOMPETENCY OF THE AORTIC VALVES.

C. E. Fitzgerald records a case in a man aged 40. Only the indirect method of examination was used; the pulsation was only noticed in a portion of the superior (inverted image) branch of the arteria centralis, extending from its point of emergence to where it crossed over one of the veins, and only in one eye, the right.—(Brit. Med. Journ., Dec. 23, 1871.)

IRITIS PIGMENTOSA.

C. Ritter details the case of a woman, æt. 52, whose right eye had been defective after a blow three years before. The cornea was slightly opaque. Behind the cloudy layers two completely black points could be seen in the layers immediately adjoining Descemet's membrane. Both were at the lower part of the cornea; the layer was about a millimeter (.04") in diameter. The black colour was extreme. There was no vascularity. The iris structure itself was not diseased, but there were numerous adhesions to the lens capsule. They were very black. The disease originated, in great part at least, in the pigment layer; the other eye was quite healthy. He thinks that the pigment must have travelled from the iris. If, as Hirschler states (see *antea*), the pigment were derived from hæmatin, it would not resemble "coal dust," it would be of a reddish-brown colour; whereas the tint, in his case and in Hirschler's cases, resembled that of iris pigment exactly. He comments on the symptoms of iritis present in Hirschler's cases.—(Zehend. Klin. Monat., x, p. 303.)

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ERRATUM.

Page 502, 12 lines from bottom, *for* Mr. Huggins, *read* Mr. Higgins.

